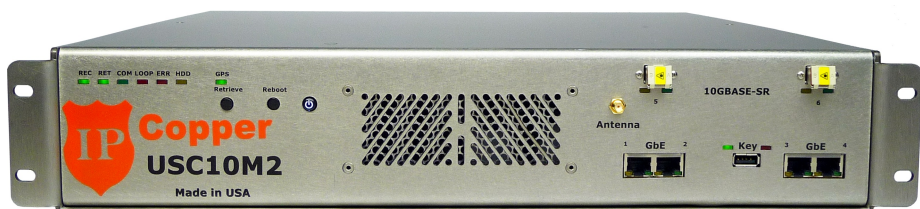# USC10M2

10G Packet Capture Appliance
with Bypass and GPS

Product Manual

Firmware Version 2.07

The information in this product manual has been carefully reviewed and is believed to be accurate. This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in later editions. Improvements or changes in the products described may be made at any time. IPCopper, Inc. makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. For the most up-to-date version of this manual, please see our website at www.ipcopper.com.

IPCopper, Inc. reserves the right to make changes to the product described in this manual at any time and without notice.

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Introduction

PRODUCT DESCRIPTION

The IPCopper USC10M2 is a standalone full packet capture appliance with 2 x 10GBASE-SR fiber optic ports, 4 x GbE ports and 48 TB storage.

Key features include:

- True bypass: In case of power loss or malfunction the USC10M2's ports switch into bypass mode to minimize network disruption. Bypass may also be manually engaged and disengaged through the management utility.

- GPS time synchronization: At bootup, the USC10M2 synchronizes to the broadcast GPS time for high-accuracy timestamping and indexing.

- Continuous-loop storage: <u>WARNING! The USC10M2 contains a built-in functionality that overwrites the oldest data with the newest</u>. When the USC10M2 reaches its 48 TB capacity, it starts over from the beginning, overwriting the oldest recorded data with the newest. The oldest data, once overwritten, is irrecoverable. The data stored on the unit will always be the most recently captured 48 TB of network activity.

SECURITY FEATURES

- Electronic invisibility: For its packet capture operations the USC10M2 uses neither an IP address nor a MAC address. This stealthiness increases the security of the appliance, while at the same time making installation as easy as connecting a few cables.

- Removable key: Unit will not boot up without the key.

- 20,000-bit dual encryption.

- Sealed all-metal, high-strength, tamperproof stainless steel enclosure.

- Encrypted access via management utility.

- Physical access control: Enable/disable retrieve mode via front panel button.

SPECIFICATIONS

Interface	2 x 10GBASE-SR 4 x 1-GbE
Capacity	o 48 TB o continuous-loop storage
Bypass	Automatic and manual o Automatically engages with loss of power o For more information see page 22
Capture & Record Speeds	o Peak: 10 Gbps o Minimum Sustained: 5 Gbps @ 6 million packets / second o For more information see page 16
Data Output Format	PCAP
Encryption	o Dual o 20,000-bit key
GPS Time Synchronization	Available o Via removable, external antenna o Manual enable/disable o For more information see page 17
Power Supply	90 ∼ 264 VAC, 47 Hz ∼ 63 Hz
Environmental	Storage temperature: -20 °C to +70 °C Operating temperature: 0 °C to +30 °C*
Dimensions	o 19 in x 3.5 in x 19 in o 47 lbs
Other	o Flow control supported o Jumbo frames supported up to 9 KB

* The USC10M2 may operate at slightly higher temperatures, however, care must be taken to ensure that there is at least one foot of unobstructed air space in front of the vents, to avoid the possible backflow of exhausted air into the unit. If placed in a cabinet, the cabinet must be ventilated.

IN THE BOX

      1   -   USC10M2 packet capture appliance

      1   -   GPS antenna

      1   -   Power cord

      1   -   USB stick, white (contains management utility)

      1   -   USB stick, black (contains key)*

* IMPORTANT! DO NOT INSERT THE BLACK USB KEY INTO A COMPUTER OR ANY DEVICE OTHER THAN THE USC10M2 WITH WHICH IT CAME. DOING SO MAY DAMAGE THE KEY AND RENDER IT NONFUNCTIONAL.

Installation

GENERAL INSTALLATION

1. Connect the fiber and/or USB cables.

    ▶ If using inline, traffic feeding into port 1 will exit out port 2 and vice versa. Likewise, traffic feeding into port 3 will exit out port 4, traffic feeding into port 5 will exit out port 6 and vice versa.

    ▶ If using a SPAN/mirror port, connect to any port (of appropriate speed / type). Please see page 34 for information on using the management utility to switch ports into dedicated SPAN mode.

    ▶ Alignment is important when inserting the fiber connectors into the fiber ports. Depending on the cable, the duplex retention bracket could skew the positioning of the optics if care is not taken to align the connectors properly when attaching the fiber cables.

2. Firmly insert the black USB key.

    ▶ Use the black USB key that came in the box with the unit. This key will only work with the unit with which it came and cannot be used with any other IPCopper device. *Do not insert this black USB key into any other equipment as this may cause it to malfunction.*

3. Connect the power cable and flip the back power switch ON.

    ▶ Once the power switch in back is flipped to the ON position, the unit will power on and begin booting up automatically. The first stage of the boot up process is self diagnostics, which takes about 5-20 seconds.

    ▶ During bootup, the red KEY light will illuminate and the COM light will blink, indicating that the unit is communicating with the key. After the unit establishes that it is the correct key, the green KEY light will illuminate and the unit will proceed to the next stage. This process takes about 5-30 seconds.

    ▶ During bootup, the USC10M2 receives signals from at least three GPS satellites and synchronizes its clock to the broadcast GPS time. During this synchronization process, the green GPS light blinks with increasing frequency as time synchronization progresses. Depending on the reception strength, it may take up to half an hour for the unit to synchronize (for more information see page 18).

► To skip GPS time synchronization, press the RET button one time while the GPS light is blinking. GPS time synchronization may also be disabled through the management utility (see page 19).

Once the unit is operational and recording, the green REC illuminates. At this point the key has been loaded into the unit's temporary memory and you may choose to remove the key or leave it in place. If you choose to remove the key, it is advisable that the unit be connected to a UPS; if the unit loses power, it will not be able to boot up again until the key is re-inserted.

If the error light illuminates, see the troubleshooting section on page 41.

INLINE VS. SPAN DEPLOYMENT

There are two methods for capturing data, either inline on the wire or via a router or switch's SPAN / mirror port. Since the USC10M2 has multiple ports, a combination of inline and SPAN modes may also be employed. For more information on the USC10M2's port modes, please see page 21.

Setting up the USC10M2 inline on the wire is simple, involving the connection of either two or four or six cables (for capturing traffic on one, two or three routes). When used inline, port 1 corresponds to port 2, port 3 to port 4 and port 5 to port 6. The biggest advantage of inline mode is the higher accuracy of recording: no intervening equipment stands between the USC10M2 and the raw traffic and the unit is able to capture and timestamp the data exactly as it traverses the wire. Another benefit is that it allows the unit to act as a buffer for other networking equipment, should traffic spike.

SPAN mode allows the recording of up to six networks or network routes on one USC10M2. The drawback of using SPAN mode is that it relies on the performance of the equipment mirroring the traffic (oftentimes a switch or a router with a SPAN port) and therefore introduces uncertainty as to the accuracy of the captured activity. The intervening equipment may re-order or drop packets; when using SPAN/mirror ports, it is quite possible to have a packet traverse the switch or router, but not be mirrored and pass out through the SPAN port. Having intervening equipment between the packet capture appliance and the source of the network traffic also introduces a delay in the packets reaching the unit, resulting in inaccurate timestamping.

Lastly, you may also have a situation where the router or switch is attempting

to feed data in excess of 10 Gbps through its SPAN/mirror port, since the traffic sent out through the SPAN/mirror port is an aggregate of all the traffic received and sent by the router/switch in both directions. Under peak loads, the switch/router may drop packets intended for the SPAN/mirror port should the traffic volume overwhelm the switch/router's buffer.

PLACEMENT / WHERE TO DEPLOY

The USC10M2's six ports and user-selectable port modes provide flexibility and versatility when it comes to deployment. The unit may be used to monitor from one to six separate networks or network segments. The USC10M2 may be placed anywhere on a network, either at the perimeter, the core or points in between; it requires no additional equipment to connect when used in inline mode, since it acts as its own network tap.

The USC10M2 captures all of the traffic that passes through it. Please note, however, that if a DHCP/NAT server (which is frequently built into consumer firewalls and routers) stands between the unit and the rest of the network or a portion of the network, the DHCP/NAT server device will mask the MAC addresses and local IP addresses of the equipment on the other side of it. If the MAC addresses and local IP addresses are needed, it would be necessary to deploy an additional packet capture appliance on the other side of the DHCP/NAT server device (for example, the DHCP/NAT server device connects to the packet capture appliance, which in turn connects to a switch; the other networked equipment/end-users would connect to the switch).

Depending on the size of your network and the type and granularity of the monitoring/recording required, if possible we recommend deploying multiple packet capture appliances throughout, precisely to capture the additional information that DHCP/NAT devices mask, as well as internal communications between computers and other devices on the network that would never make it out through the internet connection.

DEPLOYING THE USC10M2 AT A REMOTE LOCATION

If you intend to deploy the USC10M2 at a separate location and will be accessing it remotely, you may need to open UDP and TCP/IP ports on the firewall at the USC10M2's location (and possibly on any routers in between the

firewall and the unit) for the utility to use to connect to the unit. Please consult your firewall's/router's documentation for information on how to do this. For more information on using the management utility to access the USC10M2 from a remote location, please see page 29.

For remote deployment it would be advisable to change the unit's retrieve mode boot setting so that the unit boots up with retrieve mode on by default (see page 34 for instructions). When retrieve mode is off, the unit will not respond to any management communications and it will be necessary to manually toggle the unit into retrieve mode by pressing the retrieve button on the unit's front panel in order to communicate with the unit.

DEPLOYMENT SCENARIOS

Since the USC10M2 requires no configuration, it can be placed pretty much anywhere on a network. Where you choose to place the unit depends on which traffic you would like to capture. Using the USC10M2 in inline mode offers the most flexibility for deployment, however, it may also be connected to a router or switch's SPAN/mirror port. Below is a small sampling of deployment scenarios.

Scenario 1.

In this scenario, the USC10M2 is placed at the network perimeter, between the internet connection and the firewall. In this location, the unit will capture all traffic originating from the internet, even the transmissions that the firewall would block, and all the outbound traffic from the network, but none of the internal network traffic.

Scenario 2.

In this scenario, the USC10M2 is placed at the network perimeter, between the firewall and the LAN. In this location, the unit will capture all traffic originating from the internet, minus the traffic blocked by the firewall, and all the outbound traffic from the network, but none of the internal network traffic.

Scenario 3.

In this scenario, the USC10M2 is placed further inside the network, inline between a workgroup's router and the rest of the LAN. In this location, the unit will capture all traffic originating from the workgroup and all traffic destined for the workgroup. Please note that in this configuration a DHCP router will obscure the local IP addresses of the workgroup's networked equipment. The unit will not be able to capture any traffic that does not leave the workgroup.

Scenario 4.

In this scenario, the USC10M2 is placed inline between a workgroup's switch and the rest of the LAN. In this location, the unit will capture all traffic originating from the workgroup and all traffic destined for the workgroup, along with all the traffic within the workgroup itself. The advantage of this setup is that the unit would be able to capture the local IP address and MAC addresses of the workgroup, since there is no DHCP router in between the unit and the workgroup members.

Scenario 5.

In this scenario, the USC10M2 is placed inline between a database or other type of server. In this location, the unit is able to capture and record all traffic going to and from the database/server.

Understanding the Front Panel

INDICATOR LIGHTS
- REC: illumination indicates that the unit is operational and ready to capture and record
- RET: illumination indicates that the unit is in retrieve mode; also illuminates during GPS time synchronization
- COM: lights up when communicating during data retrieval, during the second stage of GPS time synchronization (see page 18) and when communicating with the USB key.
- LOOP: shines red after the initial 48 TB capacity has been reached and the unit has begun overwriting data (see page 23)
- ERR: indicates an error (see page 41)
- HDD: indicates that the hard drive is engaged
- GPS: blinks during GPS time synchronization (see page 18)

RETRIEVE BUTTON*

REBOOT BUTTON**

POWER BUTTON***

* The retrieve button has two functions. If the REC light is on, the retrieve button acts as a manual switch to enable/disable retrieve mode. If the REC light is off, all ports are in bypass mode and pressing the retrieve button switches ports 1 and 2 into inline mode.

** It may take 3-4 seconds for the unit to start the reboot process after pressing reboot button.

*** The power button may be toggled between two functions, initiating the shutdown sequence (default) or initiating reboot. Please see pages 13 and 21 for more information.

PORT INDICATOR LIGHTS
- ORANGE: indicates port is operating at gigabit / 10-gigabit speed
- GREEN: indicates connectivity
- NO LIGHTS: either port is in bypass mode or there is no connectivity

10GBASE-SR PORTS

ANTENNA

Antenna

10GBASE-SR

5

6

1 **GbE** 2   **Key**   3 **GbE** 4

KEY

GbE PORTS
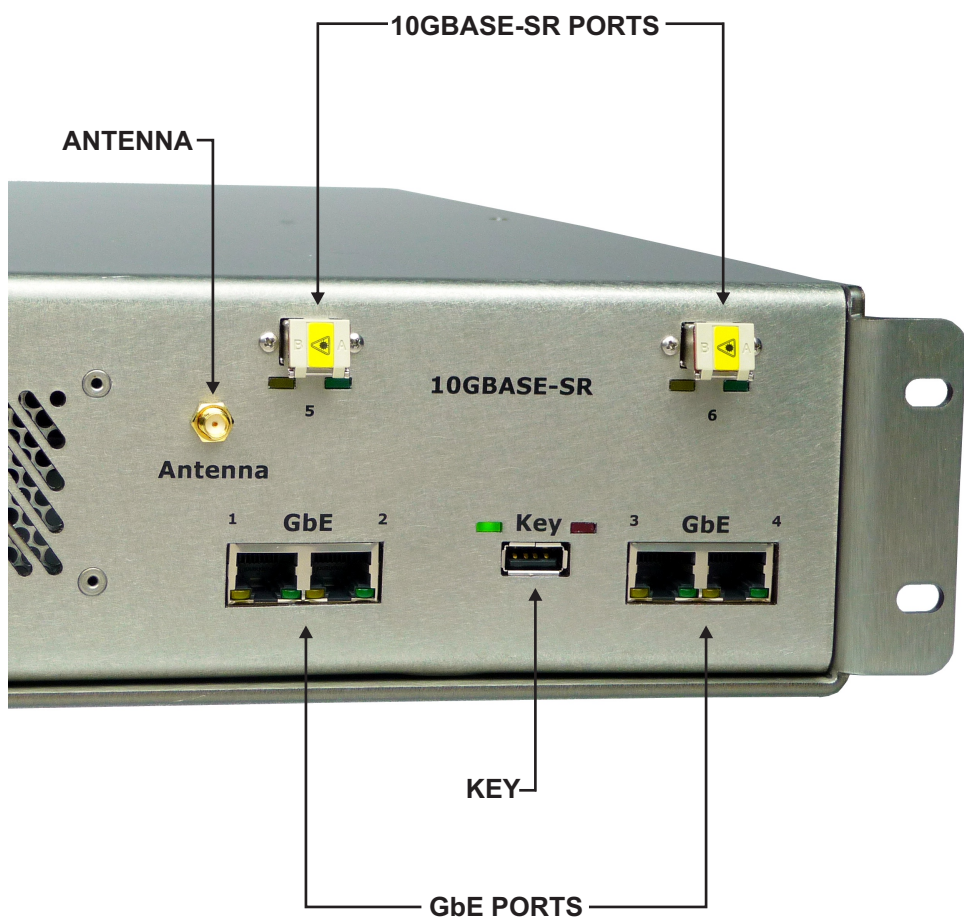
Shutdown Sequence

STANDARD SHUTDOWN SEQUENCE

When the power button is configured with power off functionality (which is the default setting), pressing the power button initiates the shutdown sequence, during which the unit engages bypass, clears its buffers and stops recording. Please follow the steps below to avoid data loss when powering down the USC10M2.

1. Press the power button on the front panel. The REC light will begin blinking.

2. Wait until the REC light ceases blinking. All indicator lights will illuminate and the power button light will turn off. At this point the unit has finished clearing its buffers and stopped recording.

3. Flip the power switch on the back of the unit to the OFF position.

IMPORTANT! ALWAYS FLIP THE POWER SWITCH ON THE BACK OFF AFTER INITIATING THE SHUTDOWN SEQUENCE.

Please note that the shutdown sequence cannot be aborted. Once the shutdown sequence has been initiated, it must be completed as per the steps above. Once the shutdown sequence has been initiated, the unit will not respond to the pressing of any buttons on the front panel until the power switch in back has been toggled OFF, then ON again.

REBOOT SHUTDOWN SEQUENCE

Pressing the reboot button causes the unit to reboot, which will very likely result in data loss (limited to the data that had not yet been stored from the buffers).

When the power button is configured as reboot, pressing the power button will cause the unit to cease recording and reboot, without processing the data that was in its buffers at the time reboot was initiated. When the REC and RET lights and all port lights turn off, it is safe to turn off the power switch on the back of the unit.

Capture and Record Speeds

PEAK AND MINIMUM SUSTAINED SPEEDS

The USC10M2 provides combined peak capture speeds on its 10GBASE-SR ports of 10 Gbps. Its four GbE ports peak at 1 Gbps.

The unit's minimum sustained capture speed is 5 Gbps at 6 million packets per second. At this rate the overhead is approximately 16 to 20 bytes per packet. Please note that the unit records the packets in their entirety, including the 4 byte checksum.

The maximum storage speed is 5.925 Gbps, including overhead.

FACTORS THAT AFFECT PERFORMANCE

If necessary, at times of higher utilization on the 10GBASE-SR ports, the USC10M2 will sacrifice performance on the 1-GbE ports in favor of 10G traffic.

Under some circumstances, very frequent status checks (for example, more than once every few minutes) and data retrieval requests may affect performance. In those circumstances, instead of achieving a performance of six million packets per seconds, you may see a 1% reduction in performance, proportional to the frequency of the management utility's control packets.

CTRL MARKER AND PERFORMANCE

Each port has a CTRL marker, which may be turned on or off. Only the ports with this marker turned on will be able to recognize and accept management packets from the utility. Turning the CTRL marker off on the 10G ports increases their capture and record performance to their full operational capabilities; turning the CTRL marker on drops the 10G ports' performance by as much as 40% to 50%. *For best performance on the 10GBASE-SR ports, we recommend turning the CTRL marker OFF for both 10GBASE-SR ports at installation and using one of the GbE ports for management.*

The CTRL marker is enabled/disabled for each port through the management utility (see page 34). By default, the CTRL marker is ON on all ports.

GPS Time Synchronization

ANTENNA PLACEMENT AND SPECIFICATIONS

When attaching the GPS antenna, firmly screw it into place on the front of the USC10M2 without bending the cable. Once you have attached the antenna, we do not recommend disconnecting it. Repeatedly detaching and reattaching the antenna may result in damage to the connector.

Place the antenna as reasonably close to a window as possible; the closer to a window the antenna is, the better the signal reception. Elevating the antenna may improve reception, but the best placement depends on the height of the nearest window and the visibility through it to the sky.

The antenna has a magnetic base, however, we strongly advise against placing the magnetic base on the USC10M2's enclosure. Placing a magnet on the unit's enclosure may harm the internal parts and cause malfunction.

The supplied antenna type has been tested indoors with the USC10M2 and performs well. Depending on the placement of your unit, a more sensitive antenna may improve the speed of signal acquisition (regardless of the sensitivity of the antenna, having a window nearby is necessary and the closer the better).

Please use the following specifications if you elect to use your own antenna:

- ➤ Active GPS antenna
- ➤ Minimum 10 Mhz bandwidth
- ➤ 1.5 dB recommended noise figure
- ➤ 1575 MHz
- ➤ 50 Ω Ohm impedance
- ➤ 3 VDC

Note on antenna cable length: Antenna cables attenuate the signal and the longer the cable, the weaker the signal. To counteract this, we recommend using low noise cables designed for wifi / GPS applications. The longer the cable length, the thicker it needs to be to reduce noise and attenuation. IPCopper units have been tested with cables over 75 feet in length.

GPS time synchronization takes place in three stages.

During the first stage, the GPS light on the front panel blinks slowly as the unit initially acquires the signal from three or more GPS satellites. The unit requires at least three satellites to ensure the accuracy of the GPS time synchronization (and to avoid the possibility of GPS signal spoofing).

During the second stage the GPS light continues to blink slowly and the COM light illuminates. At this stage, the system has recognized the stored locations of the GPS satellites, but has not yet synchronized the time. Acquisition is almost complete once the second green (RET) light illuminates; the unit has been able to receive the necessary clock information from the three GPS satellites, but has not yet locked in on the satellites.

The USC10M2 has entered the third stage of synchronization once the GPS light begins blinking rapidly. The unit is now actively tracking the satellites and synchronization is imminent, waiting only for the computations to complete.

Once GPS time synchronization has completed, the GPS light will shine steadily and the COM light will turn off.

It generally takes several minutes for the unit to acquire and identify the GPS signals from a cold start, as the unit first roughly figures out where it is in relation to the satellites and begins computations. These computations become finer and finer until the unit locks on the GPS time signal.

If the USC10M2 was in storage (offline) for several days or longer, it is possible for the internal clock to have drifted slightly. If so, it may take longer than usual for the GPS time synchronization to complete the first time the unit is booted up after being offline for a long period of time because the unit would need to re-synchronize its own internal indices.

In some circumstances, it may take up to half an hour for GPS time synchronization to complete. If unable to synchronize, a timer will abort GPS time synchronization after 30 minutes and the unit will finish booting up without GPS time synchronization.

FASTGPS OPTION

GPS satellites and the GPS system track time in GPS Time, rather than Greenwich Mean Time (GMT). Due to the rotation of the earth, errors accumulate over time and from time to time the committee that oversees GPS Time adds an extra second to GPS Time in order to compensate for these errors. These added seconds are known as leap seconds.

During GPS time synchronization, waiting for the satellites to broadcast the current leap second data may add time to the synchronization process, however, this does ensure that synchronization takes place with the most accurate data.

FastGPS may speed up GPS time synchronization. When FastGPS is enabled, the unit synchronizes its time without waiting for the satellites to broadcast the leap second data, instead using the previously stored leap second data for synchronization. Should the satellites broadcast the current leap second data while the unit is going though the other synchronization steps, however, the unit will synchronize using the current leap second data.

When using FastGPS, the unit may synchronize to a time that is one second off of the actual GPS time (depending on when the GPS time committee last added a second and when your unit last received the leap second data).

ABORTING/DISABLING GPS TIME SYNCHRONIZATION

We strongly recommend always using GPS time synchronization, not only for accuracy, but also for coherency. When the unit is off, it is possible for the internal circuitry that keeps the lock on the GPS signal alive to fail or malfunction. When this occurs, it may affect the clock. If on the subsequent power-up GPS time synchronization is disabled, the data timestamps may not be accurate; in fact, it may create an incoherency in the data indices with either gaps or overlaps in the timestamps. Should this occur, re-synchronize the unit's time using GPS time synchronization and then run a large amount of traffic through the unit, enough to overwrite the incoherent sections. The probability of this circumstance arising is rather low, nevertheless, we do recommend using GPS time synchronization to avoid it.

You may abort GPS time synchronization during bootup any time while the

GPS light is blinking by pressing the RET button one time. This will abort the current synchronization; at the next bootup, GPS time synchronization will proceed as normal.

You may disable GPS time synchronization through the management utility (see page 34). Choose the option to change settings, then follow the instructions on the screen to toggle GPS time synchronization off. The unit will not attempt to synchronize its clocks again until you re-enable GPS time synchronization through the utility.

Port Modes

The USC10M2 features two 10GBASE-SR fiber ports and four 1-GbE ports. The ports may be configured independently or in pairs via the management utility. Each port has two small indicator LEDs, one orange and one green. When illuminated, the orange light indicates that the port is operating at gigabit or 10-gigabit speed. The green light indicates connectivity. If both green and orange lights are off, either the port is in bypass mode or it has no connectivity.

  ► *For a comparison of inline versus SPAN, please see page 9.*

  ► *To change settings via the management utility, please see page 34.*

  ► *Please also read about the CTRL marker on page 16.*

INLINE MODE

When in inline mode, the ports operate in pairs. Port 1 pairs with port 2, port 3 with port 4 and port 5 with port 6. Traffic entering on port 1 will exit on port 2, and vice versa. Likewise with ports 3 / 4 and 5 / 6. When one or all pairs are in inline mode, it is not necessary to designate a port for management; any port in inline mode may be used for communicating with the management utility and retrieving data, unless the CTRL marker has been turned off (see CTRL Marker and Performance on page 16).

Should a malfunction or power loss occur when ports are in inline mode, the unit will automatically switch the inline ports over to bypass mode.

SPAN / MIRROR MODE

Use SPAN / mirror mode when connecting the port to the SPAN or mirror port on another piece of equipment. In this mode, the port can only receive and record data; it does not pass it through to any other port or send data out.

When in SPAN mode, a port cannot be used for data retrieval or status checks, though it is possible for the unit to receive communications from the management utility through it, provided retrieval has been enabled and the CTRL marker for the port is on. Should all six ports be in SPAN mode, to

initiate access to the unit you will need to connect a computer directly to one of the ports, toggle the unit into retrieve mode and then use the management utility to switch the port into either management mode or inline mode (please note that switching a port into inline mode will also switch its partner port into inline mode). Please note that if the CTRL Marker is OFF, the port will be unable to recognize any communications from the management utility.

If you change a port from either inline mode or bypass mode to span mode, its partner port will automatically switch into management mode, however, you may manually change that second port to SPAN mode, if desired. For example, if ports 1 and 2 were previously in inline or bypass mode and you change port 1 to SPAN mode, port 2 will automatically switch to management mode.

BYPASS MODE

Any pair of ports in inline mode will automatically switch over into bypass mode, should the unit malfunction or lose power. Bypass mode may also be engaged and disengaged manually through the management utility. It is possible to have all pairs of ports manually switched into bypass mode, however, this would make it impossible for the management utility to communicate with the unit (should all ports be in bypass mode, the REC indicator light will be off). In this circumstance, pressing the retrieve button will switch ports 1 and 2 into inline mode.

MANAGEMENT MODE

Management mode is useful for communicating with the unit when the other ports are in SPAN mode. When in management mode, it is possible to set both an IP address and a MAC address for the port (using the management utility). The IP address and MAC address may be any of the user's choosing and are not significant to the capture and record functions of the appliance.

When in management mode, a port cannot be used for capturing data, but only for communicating with the management utility. Even when in management mode, the appliance maintains a stealthy profile and will not respond to any attempts to elicit a response (other than ARP requests) unless they come from the management utility.

Other Features and Functions

RETRIEVING DATA / RETRIEVE MODE

Data may only be retrieved from the USC10M2 using the appliance's management utility (specifically, the copy of the utility that came in the box with the unit). For more information on the management utility, see page 25.

The unit must be in retrieve mode in order to retrieve data. If the appliance is not in retrieve mode, it will not answer any attempts at communication from the management utility. When the appliance is in retrieve mode, the green RET indicator light on the front panel illuminates. To switch the unit into retrieve mode, press the retrieve button on the front panel.

Out of the box, the USC10M2 boots up with retrieve mode OFF, however, through the management utility you may elect to have retrieve mode either ON or OFF by default. If you choose to have retrieve mode on by default, the unit will boot up in retrieve mode and pressing the retrieve button will turn retrieve mode off. Regardless of retrieval status at shutdown, at bootup the unit will revert to the chosen default setting.

When downloading data, by default the management utility downloads the data from all ports for the specified date/time range and IP/MAC address and the resulting PCAP file would contain the packets from all ports in the same file. It may not, however, be desirable to have the data from all ports combined. When downloading data, the user may identify the specific port(s) whose activity is desired (for example, from just port 1 or ports 1 and 2 and so on).

Filters may be applied to data downloads, including those for date and time range, IP address and MAC address. Users may also choose to have the data broken into separate 1 GB files instead of combined in one large file.

CONTINUOUS LOOP STORAGE (OVERWRITE)

The USC10M2 features continuous-loop storage with overwrite. Once the unit's storage has been fully utilized, it will overwrite the oldest captured data with the newest. When this occurs, the overwritten data become irrecoverable. To avoid losing important data, we advise downloading data on a regular basis.

The unit also keeps internal logs of events. Just as with the captured packets, the event log data is overwritten as the corresponding data, date- and time-wise, is overwritten.

If you require a packet capture appliance that does not overwrite the oldest data, forensic-class models are available which permanently record data to lossless storage.

FLOW CONTROL

The USC10M2 is equipped with automatic flow control, for situations where the unit is operating inline and it appears that the unit may run out of buffer space. In that circumstance, the unit may ask the network counter-party to hold traffic for a short period of time, if it can, to allow the unit to catch up and free up some buffer space. This is typically not an issue due to the USC10M2's high speed and large buffer.

This feature comes in handy when you have equipment on one side or the other of the unit that is unable to cope with the level of traffic. In that circumstance, the IPCopper unit may act as a large network buffer and moderate the network traffic to reduce the chances of the adjacent equipment losing packets.

AUTO-NEGOTIATION (PORT SPEED)

All ports on the USC10M2 auto-negotiate their speed to match the speed of the adjacent network equipment.

POWER BUTTON SETTINGS

By default, the power button initiates the shutdown sequence. Through the utility you may change the power button's function to reboot instead. In this case, when shutting down the unit you would initiate reboot and then flip the switch on the back. WARNING! ONLY SET THE POWER BUTTON FUNCTION TO REBOOT IF YOU INTEND TO KEEP THE UNIT ALWAYS OPERATIONAL. IT IS NOT ADVISABLE TO TURN OFF THE UNIT BY INITIATING REBOOT AND THEN FLIPPING THE BACK POWER SWITCH AS THIS MAY RESULT IN DATA LOSS.

Management Utility

OVERVIEW

The USC10M2's management utility is an easy-to-use menu-driven interface for securely communicating with the unit. Each USC10M2 comes in the box with a specific utility executable "mated" to the particular unit with which it came. The USC10M2 utilities are not interchangeable; an individual USC10M2 may only be accessed by the specific utility with which it came. You may find the utility for your unit located on the white USB stick that came with your unit – look for the executable named IPCD10M2_[your unit's serial number].exe.

The management utility is the only interface available for communicating with your unit, therefore we recommend that you keep a copy of your USC10M2's management utility in a safe place.
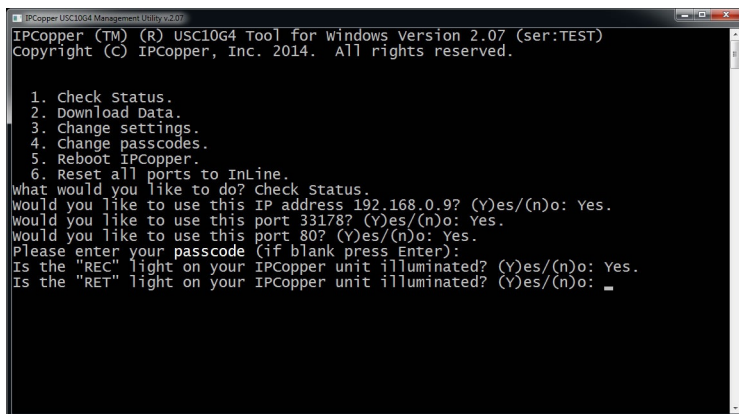
Using the management utility is very straightforward, very much like a simple question and answer session. Please visit our website at www.ipcopper.com to view videos demonstrating the menu-driven management utility.

The utility may also be customized to fit the particular needs of your organization. For more information, please contact us at 1-855-347-8074 or sales@ipcopper.com.

HOW THE UTILITY COMMUNICATES WITH THE UNIT

The USC10M2's management utility utilizes two protocols for communicating with the unit. For status checks and configuration changes the utility uses UDP; for data downloads the utility uses TCP/IP. To the casual observer it may not be entirely obvious what the management packets are for; for example, the management utility's UDP traffic for status checks and configuration changes look like pings.

Before initiating a session with the unit, the utility will ask you which UDP port and which TCP/IP port to use. These may be any port of your choosing, however, if you are accessing the unit via the internet from a remote location and the unit is located behind a firewall with restrictive settings, it may be advisable to open specific UDP and TCP/IP ports on the firewall so that it will

IPCopper (TM) (R) USC10G4 Tool for Windows Version 2.07 (ser:TEST)
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  1. Check Status.
  2. Download Data.
  3. Change settings.
  4. Change passcodes.
  5. Reboot IPCopper.
  6. Reset all ports to InLine.
What would you like to do? Check Status.
Would you like to use this IP address 192.168.0.9? (Y)es/(n)o: Yes.
Would you like to use this port 33178? (Y)es/(n)o: Yes.
Would you like to use this port 80? (Y)es/(n)o: Yes.
Please enter your passcode (if blank press Enter):
Is the "REC" light on your IPCopper unit illuminated? (Y)es/(n)o: Yes.
Is the "RET" light on your IPCopper unit illuminated? (Y)es/(n)o: _

Launching the utility gives you a menu of six options. In the example at left, the user chose Check Status, after which the system asked for the IP address and ports which with to connect to the unit.

Screenshots may be from the USC10G4, however, its operation is identical to the USC10M2 utility.

allow the management traffic for the USC10M2 through.

The utility may also be customized to fit the particular needs of your organization. For more information, please contact us at 1-855-347-8074 or sales@ipcopper.com.

INSTALLING AND LAUNCHING THE UTILITY

To install the management utility on a computer, first locate the white USB stick that came with your USC10M2 packet capture appliance.

1. Insert the white USB stick into the computer's USB drive.

2. Open the USB drive and locate the executable file named IPCD10M2_[your unit's serial number].exe. Copy the executable file to a folder of your choice on the computer.

To launch the IPCD10M2 management utility:

1. Launch the executable file named IPCD10M2_[your unit's serial number].exe by double-clicking on it.

2. The application will launch a command prompt window. When prompted, select the desired action from the menu of choices, for example, to check status, download data, change settings, change passcodes, reboot IPCopper or reset all ports to inline.

3. After you make your selection, the utility will ask a series of questions to determine how to access the unit, including which IP address to use (see screenshot above).

SELECTING AN IP ADDRESS FOR ACCESSING THE UNIT

While the USC10M2 typically does not have an IP address (unless a port in management mode has been given one manually), the management utility can connect to the unit by sending communications intended for the unit along a network route that traverses the unit. For example, if the computer you are using is on one side of the USC10M2 and another computer or other network equipment is located on the other side of the unit, you may enter that other equipment's IP address when asked by the management utility.

If you intend to access the USC10M2 from a remote location, it may be necessary to open specific UDP and TCP/IP ports on the firewall at the USC10M2's location, so that the management traffic from the utility at the remote location will be allowed through and sent along the appropriate network route to traverse the unit (for more on how the management utility communicates with the unit, please see page 25). Please see the next section, ACCESSING IPCOPPER FROM A REMOTE LOCATION on page 29, for more information on choosing an IP address when the unit is in a separate location than the utility.
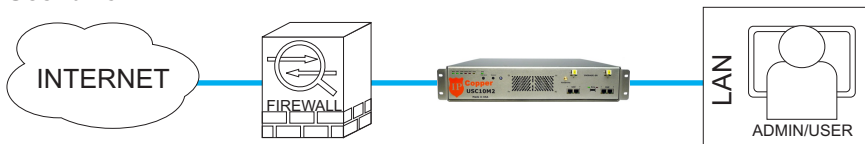
If you are not sure which IP address to use answer "no" when the utility asks you if you would like to use a particular IP address (see screenshot on previous page: "Would you like to use this IP address 192.168.0.9?"). The utility will then ask a series of questions to help you determine which IP address to use.

Below are a few scenarios for accessing the IPCopper unit.

Scenario 1.

INTERNET   USC10M2   FIREWALL   LAN   ADMIN/USER

Scenario 2.

INTERNET   FIREWALL   USC10M2   LAN   ADMIN/USER

In both scenarios illustrated above IPCopper is located inline on the wire, in one case between the firewall and the internet and in the other case between the firewall and the LAN. In either case, using an IP address from the public internet would cause the management packets to pass through the unit.
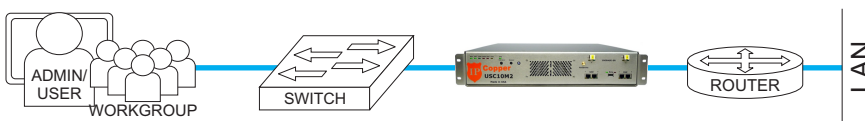
Scenario 3.

In this scenario, the USC10M2 is placed further inside the network, inline between a workgroup's router and the rest of the LAN. To access IPCopper from a computer located in a different part of the LAN, use the IP address of the router.

Scenario 4.

In this scenario, the USC10M2 is placed further inside the network, inline between a workgroup's router and the rest of the LAN. To access the unit from a computer within the workgroup, you may use the IP address of any LAN equipment on the other side of IPCopper or an IP address from the public internet.

Scenario 5.

In this scenario, the USC10M2 is placed inline between a workgroup's switch and the rest of the LAN. To access the unit from a computer within the workgroup, you may use the IP address of any equipment on the other side of IPCopper, for example, the router, or an IP address from the public internet.

Scenario 5.

In this scenario, the USC10M2 is placed inline between a workgroup's switch and the rest of the LAN. To access the unit from a different part of the LAN, use the IP address of one of the computers in the workgroup.
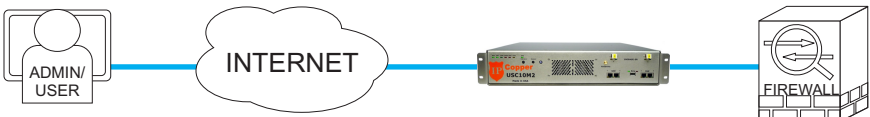
Scenario 7.

In this scenario, the USC10M2 is placed inline between a database or other type of server. To access IPCopper, use the IP address of the database/server.

ACCESSING IPCOPPER FROM A REMOTE LOCATION

Depending on where the USC10M2 is located, when accessing the unit from a remote location, it may be necessary to open specific UDP and TCP/IP ports on the firewall at the USC10M2's location, so that the management traffic from the utility at the remote location will be allowed through and sent along the appropriate network route to traverse the unit (for more on how the management utility communicates with the unit, please see page 25).

The scenarios above provide guidance on selecting an IP address for accessing the USC10M2 when the utility is not at the same location as the unit.
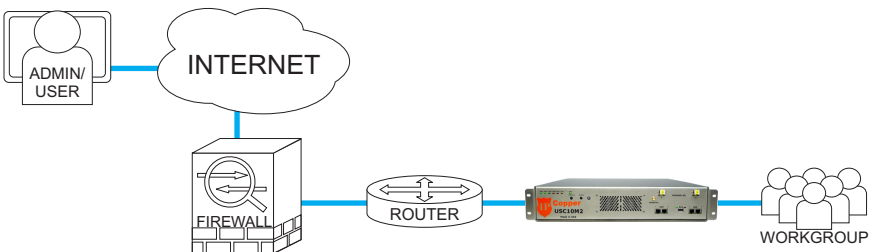
Scenario 1.

In this scenario, the USC10M2 is placed at the network perimeter, inline between the internet connection and the firewall. To access the IPCopper unit remotely, the admin/user would use the IP address of the firewall located on the other side of the unit.

Scenario 2.
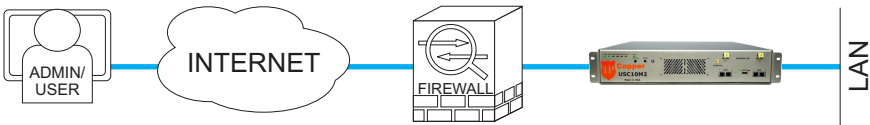
In this scenario, the USC10M2 is placed almost at the network perimeter, inline between the firewall and the LAN. To access the IPCopper unit remotely, the admin/user would use the IP address of the network equipment located inside the LAN, on the opposite side of IPCopper from the firewall. In this scenario, it may be necessary to open specific UDP and TCP/IP ports on the firewall, so that management packets would be allowed through to traverse the IPCopper unit.

Scenario 2.

In this scenario, the USC10M2 is placed inside the LAN, in between a router and a workgroup. To access the unit, the admin/user would use the IP address of a member of the workgroup. In this scenario it may be necessary to open specific UDP and TCP/IP ports on the firewall, so that management packets would be allowed through to traverse the IPCopper unit.
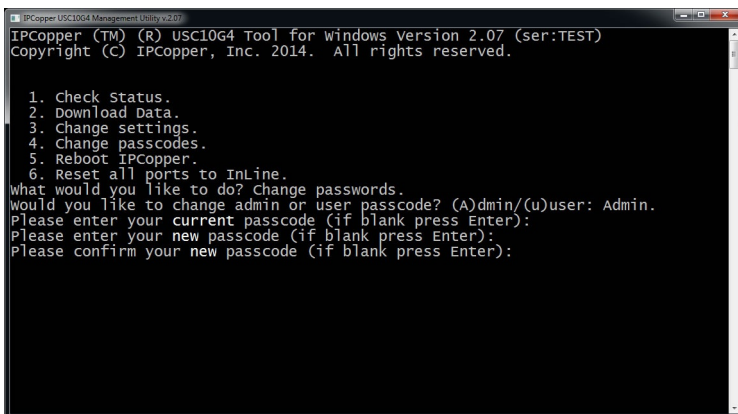
ADMIN AND USER PASSWORDS

Out of the box, both admin and user passwords are blank by default. Only the admin can change passwords. Passwords are limited to a length of 12 characters, and should conform to hex-decimal format (you may use any number from 0 - 9 and any letter from A - F).

IMPORTANT! Do not lose the admin password. To reset the admin password requires physical access to the unit and it would be necessary to contact IPCopper tech support for assistance. IPCopper tech support would not be able to remotely reset the password, however, they can provide specific instructions on how the reset the password. This process may require a firmware upgrade. *Please note it may be necessary to send the unit to IPCopper tech support to have the password reset.*

When checking status, retrieving data or changing settings, the interface will prompt the user for a password. The unit will check the entered password against those set for the admin and user and grant privileges for that session based on which one it matches. Please note that if the password entered matches neither admin nor user, the unit will not respond. This is a security feature to protect the unit against brute force attacks. Should you enter the incorrect password, you will need to relaunch the management utility and start over.

Entry of the admin password allows the user to change any settings, including the passwords for both admin and user, as well as to run status checks and data downloads. Only the admin is able to change settings and passwords.

Changing the admin passcode.

Entry of the user password only allows status checks, unless the admin has data download privileges.

CHANGING PASSWORDS

Please note that only the admin can change passcodes. Out of the box both admin and user passcodes are blank. Once you change the admin passcode to a nonblank code you must also change the user passcode to a nonblank code. To change either the admin or user passwords, launch the management utility.

1. Enter "4" to select Change passcodes from the menu of options.

2. The utility will first lead you through a series of questions to determine how best to communicate with the unit (see "SELECTING AN IP ADDRESS FOR ACCESSING THE UNIT" on page 27).

3. When prompted, enter "a" to change the admin passcode or "u" to enter the user passcode.

4. When prompted, enter the admin passcode.

5. When prompted, enter the new passcode. Passwords are limited to a length of 12 characters, and should conform to hex-decimal format (i.e., you may use any number 0 - 9 and any letter A - F).

6. When prompted, re-enter the new passcode to confirm the change.

IMPORTANT! Do not lose the admin password. To reset the admin password requires physical access to the unit and it would be necessary to contact IPCopper tech support for assistance. IPCopper tech support would not be able to remotely reset the password, however, they can provide specific instructions on how the reset the password. This process may require a firmware upgrade. *Please note that it may be necessary to send the unit to IPCopper tech support to have the password reset.*

STATUS PAGE

To check the status of your USC10M2 unit, launch the management utility (IPCD10M2_[your unit's serial number].exe) and select Check Status from the menu of options. The utility will lead you through a series of questions to determine how best to communicate with the unit (see "SELECTING AN IP ADDRESS FOR ACCESSING THE UNIT" on page 27), then retrieve the status

```
IPCopper USC10G4 Management Utility v2.07                                    _ □ x
IPCopper USC10G4 Firmware: 2.07            1. Port1 is Up @ 1Gbps FD.
HDD Capacity  :24.004 TB Used        :0.0178% Recv: 0bps / 0p
Retrieve      :On        Download    :On      Mode: InLine CTRL
FastGPS       :On        SyncGPS     :On
Overwrite     :Off       GPS         :Sync Ok 2. Port2 is down.
Unit's Name   :                               Recv: 0bps / 0p
Location      :                               Mode: InLine CTRL
Management IP  : 3.176.193.74 / off
Management MAC : A5-A6-0B-50-98-24 / off       3. Port3 is down.
Temperature °C : 58 40 33 36 39 12.06V         Recv: 0bps / 0p
Fan Speed RPM  : 2200 3600 2200                Mode: InLine CTRL
IRQ            : 0.000/ 0.000
Buffers (% used) : 0 0 0 0 25                  4. Port4 is down.
HDD            : 0.000 Gbps                    Recv: 0bps / 0p
Load CPUs      : 0.016% 0.001% 0.000%          Mode: InLine CTRL
Drops & Errors : 0 0 0 0
IPC Current Date : 12-11-2014 02:08:36.049 GMT 5. Port5 is down.
Local Date     : 12-11-2014 02:08:52.594 GMT   Recv: 0bps / 0p
IPC Boot Date  : 12-11-2014 02:01:40 GMT       Mode: InLine CTRL
Up Time        : 6 mins 55 secs
Indexed :                                      6. Port6 is down.
Indexed :                                      Recv: 0bps / 0p
Indexed :                                      Mode: InLine CTRL

Enter 1-6 for port details/(U)pdate/(A)utoUpdate/(Q)uit: _
```

The status page displays the unit's current settings and performance statistics, as well as the status of the individual ports. Entering an individual port number will provide additional port statistics.

information from the USC10M2.

Running a status check yields a status page with a number of statistics on the functioning and operations of the unit (see screenshot below). Much of the information on the status page is diagnostic in nature, and is there in case the unit malfunctions and IPCopper personnel need to diagnose the problem. For security reasons, IPCopper personnel have no facilities to remotely connect to your IPCopper unit.

- HDD Capacity: Indicates unit's total hard drive capacity. The percentage indicates how much has been used.

- Retrieve: Indicates whether unit has been set to boot up with retrieve mode ON or OFF.

- Download: Indicates whether user has been granted data download privileges.

- FastGPS and SyncGPS: Indicate the unit's current GPS synchronization settings. If SyncGPS is OFF, GPS time synchronization has been disabled and the unit will not synchronize its time to GPS time at bootup. For more information, please see "GPS Time Synchronization" on page 17.

- GPS: Indicates the outcome of the last time the unit attempted to synchronize its time to GPS time. "Sync ok" indicates that the most recent GPS time synchronization attempt was successful.

- Overwrite status: If OFF, the unit is still on its first loop of recording, has not yet reached capacity and is not yet overwriting any data. If this indicator is ON, it means that the unit is beyond the first recording

loop and is now overwriting the oldest data with the newest. Once overwrite is on, the utilization percentages indicate the percentage that has been recorded since the end of the last "lap." For example, if overwrite is off and utilization is 5%, only 5% of capacity has been utilized. If overwrite is on and utilization is 5%, 100% of capacity has been utilized, however, 5% of that has taken place since the beginning of the current loop.

- Unit Name and Location: These are user-designatable IDs. They are informational only, for convenience in managing multiple IPCopper units and have no bearing on the unit's or the utility's operations.

- Indexed data: The status page shows indexed data, that is, data that has already been indexed. The USC10M2 automatically indexes the data as it records it, however, under normal operations there is always a slight lag between the last indexed date and time and the current date and time. Normally you should see only one big index covering an entire, continuous time period, however, it is rare but possible to have additional indexed periods with other time intervals. This circumstance should not occur as long as GPS time synchronization is used to ensure that the unit's clock keeps counting forward in time.

- Drops and Errors: The first number refers to packets that were received properly but not stored, either because it was received on a port in a mode that does not record data or because it was dropped intentionally to avoid data corruption due to data overload. The second number refers to packets that the unit attempted but was unable to store due to running out of buffer space, most likely caused by excessive throughput or a malfunction. The third number refers to packets that were received on a port in inline mode that the unit was unable to transmit out through the companion port due to running out of buffer space and were therefore not recorded (to ensure data coherency for data retrieval, the unit drops the packet in this situation). This situation could be triggered by a retrieval request occurring at a time when the unit is operating at close to the rated load or during times of excessive load. The unit has been designed and tested to peak at 10 Gbps, however, those peaks generally can only be sustained for short period of time. The fourth number refers to packet retrieval errors, which occur when retrieval requests fail due to a checksum failure for a chunk of data. The unit was able to detect

that there was data stored but was unable to retrieve it to due CRC error or a failure to decrypt.

The right-hand column gives the status of the individual ports. For more information on an individual port, enter the desired port number (1 - 6).

To update the status page, enter "u" to update once. You may also choose to set the utility to check and update the status every one to sixty minutes by entering "a," then entering the number of minutes desired between status checks.

CHANGING SETTINGS

To change any settings other than admin and user passcodes, launch the management utility and select option 3. Change Settings from the main menu. This will bring up a screen very similar to the Check Status screen, but with codes for the changeable settings highlighted (see screenshot below).

R: Change the boot setting for retrieve mode. If Retrieve is ON, the unit will boot up with retrieve mode turned on.

F: Change the FastGPS setting. If ON, the unit will use the FastGPS option for GPS time synchronization; if OFF, unit will use the standard GPS time synchronization process (please see GPS Time Synchronization on page 17).

P: Change power button settings. If "Power off," the power button will initiate the shutdown sequence; if "Reboot," pressing the power button reboots the unit (please see "Shutdown Sequence" on page 15). Please

Pressing the associated key for a setting that is either ON or OFF toggles its value. For other settings you will be asked to enter a specific value at the bottom of the screen.


```
IPCopper USC10G4 Management Utility v.2.07
IPCopper USC10G4 Firmware: 2.07                     1. Port1 is down.
HDD Capacity  :24.004 TB Used        :1.0136%  Recv: 0bps / 0p
R. Retrieve   :On         D. Download  :On      Mode: InLine CTRL
F. FastGPS    :On         G. SyncGPS   :On
Overwrite     :Off        GPS          :Sync Ok  2. Port2 is down.
P. Power Button  : Power Off                     Recv: 0bps / 0p
N. Unit's Name   :                               Mode: InLine CTRL
L. Location      :
I. Management IP : 212.255.63.0 / off            3. Port3 is down.
M. Management MAC: E8-89-66-9F-04-00 / off       Recv: 0bps / 0p
Temperature °C    : 51 36 29 32 35 12.06V        Mode: InLine CTRL
Fan Speed RPM     : 3200 7400 2200
IRQ               : 0.000/ 0.000                 4. Port4 is Up @ 1Gbps FD.
Buffers (% used) : 0 0 0 0 25                    Recv: 1.000 Kbps / 2p
HDD               : 0.000 Gbps                   Mode: InLine CTRL
Load CPUs         : 0.016% 0.002% 0.000%
Drops & Errors    : 0 0 0 0                      5. Port5 is down.
IPC Current Date : 12-19-0014 02:41:44.041 GMT  Recv: 0bps / 0p
Local Date       : 12-19-2014 02:41:56.481 GMT  Mode: InLine
IPC Boot Date    : 12-19-0014 02:38:03 GMT
Up Time          : 3 mins 40 secs               6. Port6 is down.
Indexed : 12/17/14 01:28:28 - 12/17/14 01:34:00 Recv: 0bps / 0p
Indexed :                                        Mode: InLine

Enter highlighted symbol to change setting or refres(H)/(Q)uit: _
```

```
IPCopper USC10G4 Management Utility v.2.07
IPCopper USC10G4 Firmware: 2.07                       1. Port1 is down.
HDD Capacity  :24.004 TB Used          :1.0136%  Recv: 0bps / 0p
R. Retrieve   :On        D. Download  :On          Mode: InLine CTRL
F. FastGPS    :On        G. SyncGPS   :On
Overwrite     :Off       GPS          :Sync Ok   2. Port2 is down.
P. Power Button  : Power Off                        Recv: 0bps / 0p
N. Unit's Name   :                                  Mode: InLine CTRL
L. Location      :
I. Management IP : 212.255.63.0 / off            3. Port3 is down.
M. Management MAC: E8-89-66-9F-04-00 / off         Recv: 0bps / 0p
Temperature °C   : 51 36 29 32 35 12.06V            Mode: InLine CTRL
Fan Speed RPM    : 3200 7400 2200
IRQ              : 0.000/ 0.000                   4. Port4 is Up @ 1Gbps FD.
Buffers (% used) : 0 0 0 0 25                       Recv: 1.000 Kbps / 2p
HDD              : 0.000 Gbps                        Mode: InLine CTRL
Load CPUs        : 0.016% 0.002% 0.000%
Drops & Errors   : 0 0 0 0                         5. Port5 is down.
IPC Current Date : 12-19-0014 02:41:44.041 GMT     Recv: 0bps / 0p
Local Date       : 12-19-2014 02:41:56.481 GMT      Mode: InLine
IPC Boot Date    : 12-19-0014 02:38:03 GMT
Up Time          : 3 mins 40 secs                 6. Port6 is down.
Indexed : 12/17/14 01:28:28 - 12/17/14 01:34:00 Recv: 0bps / 0p
Indexed :                                           Mode: InLine

Set Port5: (I)inline/(B)ypass/(S)span/(M)anagement/(C)ontrol: _
```

Pressing an individual port's number lets you change the port number and turn the CTRL market on and off.

note that if the power button is set to "Power off" and you initiate the shutdown sequence, the key must be present to boot the unit back up.

N: Enter or change a user-selectable name for the unit. This setting is informational only and has no bearing on the unit's or the utility's operations.

L: Enter or change a user-selectable location for the unit. This setting is informational only and has no bearing on the unit's or the utility's operations.

I: Enter or change the user-selectable management IP address. Please note this IP address entry is only active when you have a port set to management mode.

M: Enter or change the user-selectable management MAC address. Please note this MAC address entry is only active when you have a port set to management mode.

D: Enable or disable user's ability to download data. The user can only download data from the unit if the admin grants them the privilege.

G: Enable or disable GPS synchronization. If OFF, the unit will not go through GPS synchronization at bootup. For more information, please see "GPS Time Synchronization" on page 17.

1 - 6: Select the individual port for which you would like to change settings, including the port mode and the CTRL Marker status.

Entering a port number will give you the option to change that particular port's mode (to either Inline, Bypass, Span or Management). Entering "C" for

Control toggles the CTRL marker on or off. Please see CTRL MARKER AND PERFORMANCE on page 16 for more information on the control marker and how enabling and disabling it affects performance.

DOWNLOADING DATA

To download data, launch the management utility and select option 2. Please note that the log file and PCAP file will be downloaded into the same folder in which the management utility executable resides.

1. The utility first prompts you to enter a name to use for the log file.

2. Next the utility asks for the name to use for the PCAP data file.

3. The utility then gives you the option of downloading the PCAP data as one file or a series of 1 GB files. Answer "no" if you want one large file

The utility will ask you to define several data retrieval parameters before initiating the download.

downloaded, "yes" to have the data downloaded in separate 1 GB chunks.

4. Choose the desired date/time range for the download. You may choose from a menu of pre-set options or enter "8" to manually select the start and end times of the data to be downloaded. The software automatically inserts the slashes and colons, using the format provided – two-digit month, day and year separated by slashes and military time for the hours, minutes and seconds, separated by colons.

5. Next the utility asks a series of questions to determine the details for the data download, including for which ports you would like to download data (you may enter an individual port number, a list of port numbers separated by spaces or A for all ports); whether you would like IP address or MAC address filters applied to the download; whether you would like to discard packets with invalid checksums (because IPCopper stores the original checksums for every packet off the wire, you have an option to include packets with invalid checksums); whether you would like to store FCS/CRC information in the PCAP file; and whether you would like to use the 10GB offset (for more information, see "Offset" on next page).

6. Lastly, the utility asks three questions about the IP address and port numbers to use to access the unit (see SELECTING AN IP ADDRESS FOR ACCESSING THE UNIT on page 27).

7. Enter your passcode when prompted.

8. Before initiating the download, the utility asks you to confirm that the

During the data download, the utility will display a number of statistics about the download, including current and average speed and total amount of data downloaded so far.


```
IPCopper USC10G4 Management Utility v.2.07
Please enter Date/Time range for your data download: All Data.
Please enter Port Numbers for this download (1-6, A for All): All Ports.
Would you like to apply an IP address filter to the download? (N)o/(y)es: No.
Would you like to apply a MAC address filter to the download? (N)o/(y)es: No.
Would you like to discard packets with invalid checksum? (Y)es/(n)o: Yes.
Would you like to store FCS/CRC in PCAP file? (N)o/(y)es: No.
Would you like to use 10GB offset? (Y)es/(n)o: Yes.
Would you like to use this IP address 192.168.0.9? (Y)es/(n)o: Yes.
Would you like to use this port 33178? (Y)es/(n)o: Yes.
Would you like to use this port 80? (Y)es/(n)o: Yes.
Please enter your passcode (if blank press Enter):
Is the "REC" light on your IPCopper unit illuminated? (Y)es/(n)o: Yes.
Is the "RET" light on your IPCopper unit illuminated? (Y)es/(n)o: Yes.

IPC Current Date : 12-19-2014 02:40:11.670 GMT
Local Date       : 12-19-2014 02:40:24.077 GMT
IPC Boot Date    : 12-19-2014 02:38:03 GMT
Up Time          : 2 mins 8 secs
Download request for [Beginning - End] sent.
Located IPC ID.

Downloaded      : 9.622 Mbytes        Current Speed   : 75.785 Mbps
Average Speed   : 37.388 Mbps         Date Processed  : 12/16/14
Total Stored    : 9.298 M             Invalid checksum : 0
Total Packets   : 77.484 K
```

RET and REC lights on the unit are illuminated. This is to make sure that the unit is in a state where it can receive management packets. Under normal operations the REC light will be on; if it is off, there may be a connectivity or other problem that would prevent the unit from receiving management packets. The RET light indicates whether the unit is in retrieve mode – it must be in retrieve mode, indicated by illumination of the RET light, in order to recognize and act on management communications. If the RET light is off, press the retrieve button on the front panel to toggle the unit into retrieve mode.

Once the utility has initiated the download it will display the progress of the request on the screen. When complete, the utility will display a number of statistics on the screen about the download, including the total amount of data downloaded, the average speed of the connection during download, the total number of packets, the date the request was processed and the quantity of packets with invalid checksums.

The utility will save the log file and the PCAP file(s) in the same folder in which the management utility executable resides.

TIPS FOR RETRIEVING DATA

- If All Ports in SPAN Mode: When all ports are in SPAN mode, you cannot specify a management IP address during the utility's retrieval process. Instead, when prompted, answer that you do not know the IP address to use and the subsequent questions will lead you through the rest of the process.

- Offset: When retrieving data you may specify an "offset" in order to avoid attempting to retrieve data that is currently in the process of being overwritten. By default the offset is set to 10 GB, which means that the retrieval will not retrieve any data within 10 GB of the earliest data on the machine. In most cases 10 GB is a sufficient offset, however, if your unit is capturing and recording at higher than average speeds, then a larger offset, as much as 100 GB, may be necessary. Should you attempt to retrieve data that is in the process of being overwritten, the retrieval request will abort and you will need to start over with a new retrieval request.

HOW THE OFFSET PREVENTS CONFLICT
BETWEEN DATA RETRIEVAL AND DATA
STORAGE/OVERWRITE
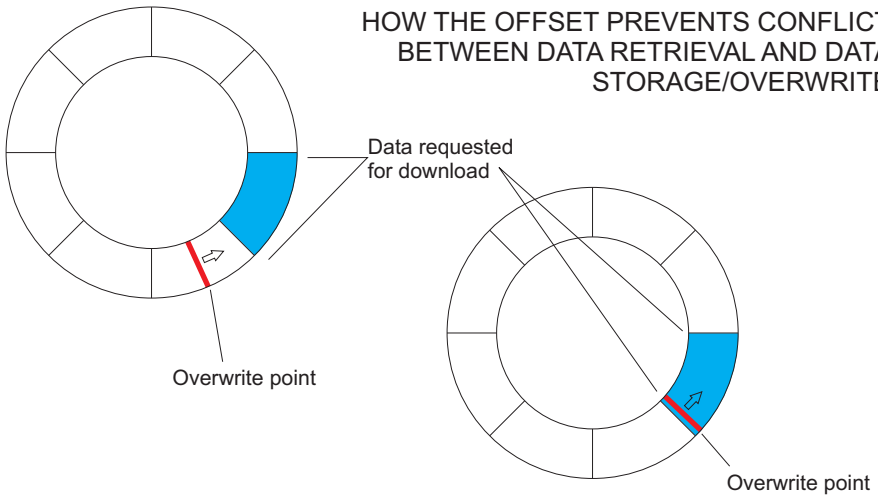
Data requested
for download

Overwrite point

Overwrite point

The data retrieval request above encompasses portions of data close to the point at which the oldest data is being overwritten with the newest. During the course of the data download, the overwrite point reached the portion of the data requested for download and the data download failed.
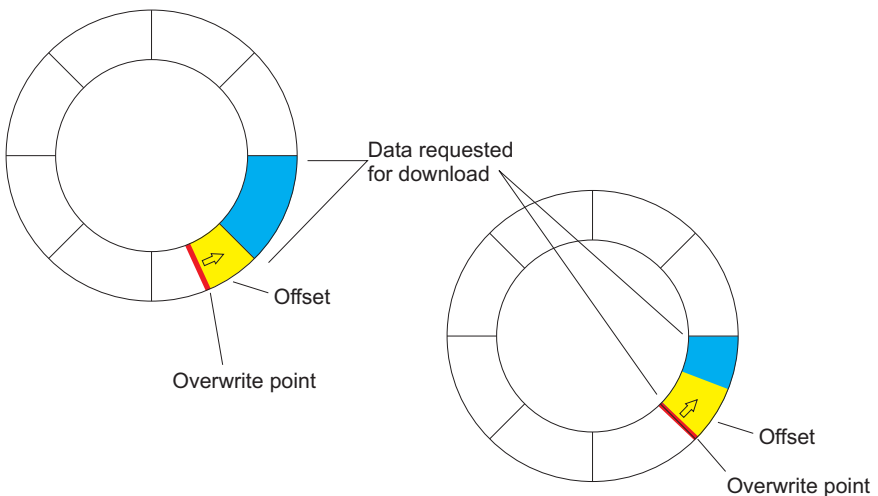
Data requested
for download

Offset

Overwrite point

Offset

Overwrite point

The data retrieval request above encompasses portions of data close to the point at which the oldest data is being overwritten with the newest, however, an offset has been utilized. While processing the data retrieval request, IPCopper determines from which point the requested data starts. If that point is within the immediate overwrite zone, IPCopper will shift the beginning of the retrieval away from the immediate overwrite zone by the specified offset.

- If you need to retrieve large chunks of the earliest recorded data on the machine, to avoid running into an issue with the offset and overwrite (see above) it would be advisable to remove the unit from operation and then retrieve data via a port set to management mode. By doing this you can ensure that the unit is not capturing any data during the retrieval process (and therefore, not overwriting).

- Please also see CTRL MARKER AND PERFORMANCE on page 16. Ports with the CTRL marker turned off will not be able to recognize, accept or act on any management packets sent from the management utility, including data retrieval requests.

Troubleshooting

The tips below should help resolve most issues that you may experience with your IPCopper packet capture appliance, but we are here to help if you need further assistance. Even if your appliance is no longer within the warranty period, please contact us with any questions or concerns you may have about the operation of your USC10M2 at support@ipcopper.com. When contacting tech support, please include your unit's serial number, the model number and a description of the problem. You would receive an automated acknowledgment that your email was received. Most emails are answered within 24-48 business hours.

ERROR LIGHT ILLUMINATED

1. Press the reboot button to reboot the unit. In most cases this should clear the error.
2. Shut the unit down, remove from power and re-connect to power using a different power cord and different outlet, then reboot the unit.
3. Change all ethernet cables connected to the unit, then reboot.
4. Disconnect all ethernet cables, reboot the unit and observe whether the error light persists.
5. Verify that the USB key is firmly seated in its slot.
6. Verify that the correct USB key has been inserted into the unit's key slot. You should use the black USB key that came in the box with the unit. If the incorrect USB key is inserted, the unit will not boot up.

If the error light persists after several attempts to reboot the unit, changing cables and changing the power sources as suggested above, there may be a problem with the unit's hard drive or other internal component. Please contact IPCopper tech support for more assistance.

UNABLE TO CONNECT TO INTERNET

1. Is the error light on? If yes, see section above.

2. Check the ethernet cables to confirm that they are firmly connected at both ends. Also confirm that the unit is connected to power and the power switch in the back is on the ON position.

3. Check for loose network cables between your computer and the unit.

4. Check the status lights on your modem, to confirm whether your internet connection is operational.

5. If the unit has just been rebooted or is booting up for the first time after a power outage, confirm that the USB key is firmly inserted in the USB slot. The USB key is necessary for the unit to boot up and if the USB key is missing, the unit will not be able to boot up.

6. Check the green and orange Ethernet port lights. If they are off, it may indicate a lack of connectivity. See points 2 and 3 above.

7. It is possible that the unit's ports are either in management mode or SPAN mode. If so, you would not be able to connect to the internet through the unit. In order to connect to the internet or other parts of the network through the unit, the unit must be in either inline or bypass modes. For more on port modes, please see page 19.

RED KEY LIGHT ILLUMINATED

1. Make sure that the USB key is firmly seated in the key slot.

2. Verify that the correct key has been used. The unit will not boot up unless the correct key is inserted. You must use the black USB key that came in the box with the unit.

After verifying and inserting the correct key, the error light will continue to blink for a short time, then turn off, after which the unit will attempt to communicate with the key and verify that it is correct (the COM light will blink).

## NOTHING HAPPENS WHEN UNIT CONNECTED TO POWER, NO LIGHTS

1. Confirm that the power cord is firmly connected at both ends and the power switch on the back is in the ON position.

2. Toggle the power switch on the back OFF, wait a few seconds, then toggle back to the ON position.

3. Use a different power cord and/or electrical outlet.
4. Try using a surge protector or UPS (uninterruptible power supply). Or, if already using, try using a different one.

If none of the above makes a different, please contact IPCopper technical support for further assistance. Please note that if you have recently experienced power fluctuations, spikes or outages, such as those due to a storm, some of the unit's internal components may have been affected. We highly recommend that IPCopper appliances always be connected to power via a surge protector or UPS for protection against power spikes, surges and other fluctuations in the electrical grid.

Power Supply Fuse

A replacement power fuse for the power supply may be found behind the small door in the power supply housing. The power inlet contains three fuses, one of which is a spare. If the power supply fuses get blown, you will have to remove the fuse assembly (which is part of the inlet) to replace them. Use a flathead screwdriver to pry the fuse assembly out.
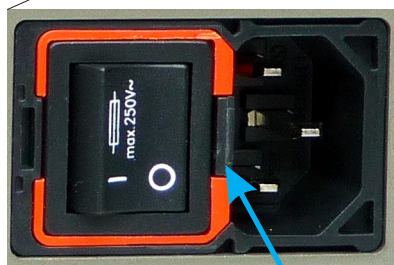
Pry fuse assembly out
using a flathead screwdriver

Additional Resources

General . . . . www.ipcopper.com

Hardware Troubleshooting . . . . www.ipcopper.com/support.htm

Other Support. . . . . www.ipcopper.com/support.htm

Warranty Claims . . . . www.ipcopper.com/warranty.htm

Contact Information

IPCopper, Inc.
7180 SW Fir Loop #100
Portland, OR 97223

Toll Free: 1-855-347-8074

Phone: 503-290-0110

Fax: 503-290-0111

www.ipcopper.com