



**M12M Oncore™ Timing/Navigation
Evaluation Kit
Quick Start Guide**

Version 1.0
19/01/2007

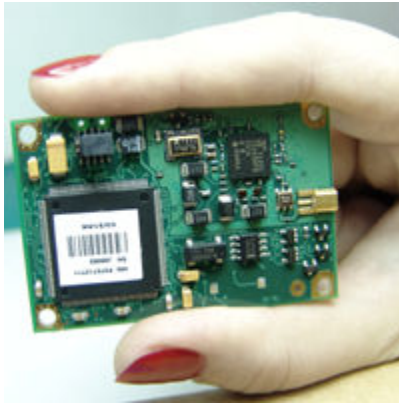
Presented by:
i-Lotus Corporation Pte. Ltd.
Sales & Marketing Department

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M12M Timing Oncore™



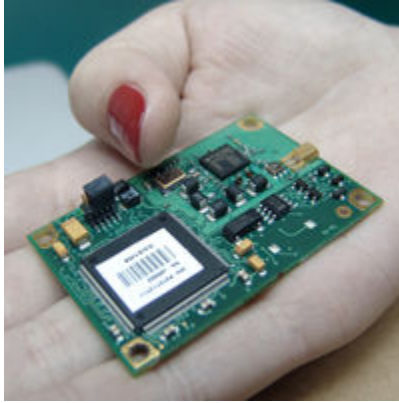
M12M Timing Oncore™ Receiver is a 12 channel precise GPS timing module that gives you up to nano seconds accuracy of time synchronization.

Features included precise, programmable, one-pulse-per-second (1PPS) or 100 pulse-persecond (100PPS) outputs. Built with cost effective in mind, you can equip your stationary applications with precise GPS or UTC time synchronization at an affordable cost.

M12M Timing™ also incorporates the Timing RAIM (Receiver autonomous integrity monitoring) algorithm to ensure validity and reliable GPS measurements.

Design to work in tough conditions, M12M undergoes various drop and temperature test before rolling out into the market

M12M Navigation Oncore™



M12M Navigation Oncore™ Receiver is an intelligent 12 Channel GPS sensor intended to be used as a component in a precision positioning, navigation, or timing system. The M12M is capable of providing precise autonomous position, velocity, and time information instantly.

With the support for inverse differential GPS operation, M12M gives highly precise location accuracy.

M12M Timing/Navigation Oncore™ Evaluation Kit



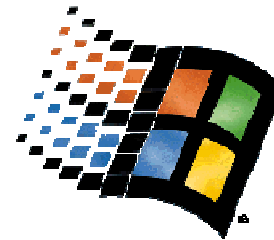
Figure 1

Items consist of the EVK box

<i>Item</i>	<i>Description</i>	<i>Quantity</i>
1	M12M Oncore™ Evaluation Package	1
2	M12M Oncore™ Evaluation Kit	1
3	User Manual	1
4	Documentation, Software CD	1
5	RS 232 Cable	1
6	GPS Active Antenna	1
7	USB A – USB Mini Cable	1
8	M12M Timing or Navigation Oncore™ Sample	1

System Requirements

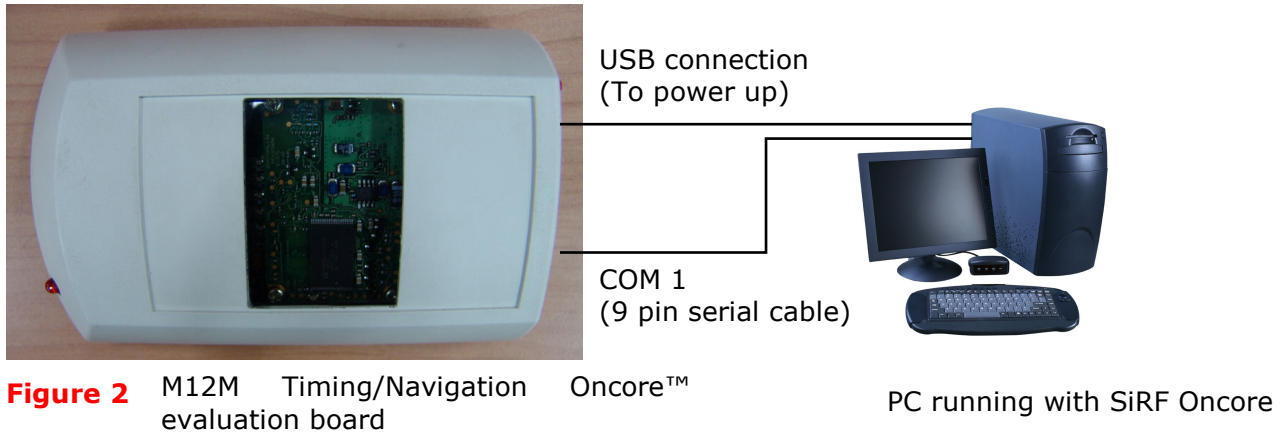
The SiRFOncore software **requires a PC running Windows™ 2000, Windows™ XP, or Windows™ NT**. The kit has been configured to support several serial port/USB port configurations in an attempt to insure that most users will be able to operate the kit without buying any extra cables, power supplies, etc. At a minimum, the host system must have at least one USB port. The availability of extra USB or serial ports just gives you more flexibility in the way the Evaluation kit can be configured. Several typical configurations are shown below. For autonomous operation all that is required is a serial USB connection between the M12M Timing/Navigation Oncore™ board and the host PC.



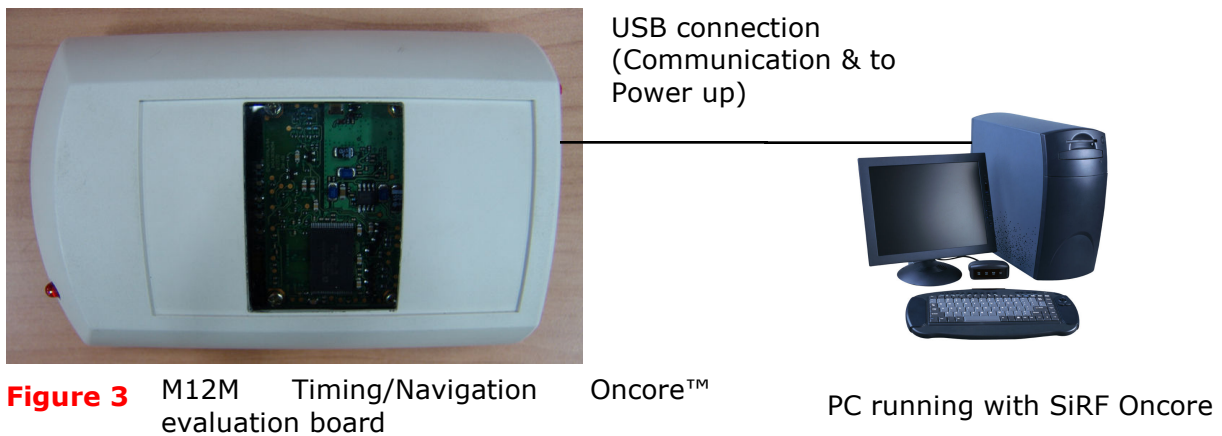
Windows NT

System Configuration

Configuration 1



Configuration 2



Notes: If the host computer has no USB ports the Evaluation Board may be powered with a standard "wall-wart" power supply. The supply should be rated for +5-9VDC at 200mA. The DC connector is 2.1mm in diameter with (+) on the center pin.

Getting Started



Figure 4

M12M Timing/Navigation Oncore™ Evaluation Board Description

The M12M Timing/Navigation Oncore™ Evaluation Board supports the M12M Timing/Navigation Oncore™ by supplying it with power and a communications interface with the host computer. The Evaluation Board can communicate with the host through either a USB port or a standard serial port by changing jumpers on the board. In addition, the board receives power either through the USB cable or a +5-9Vdc external power supply (not supplied with the kit).

Jumpers

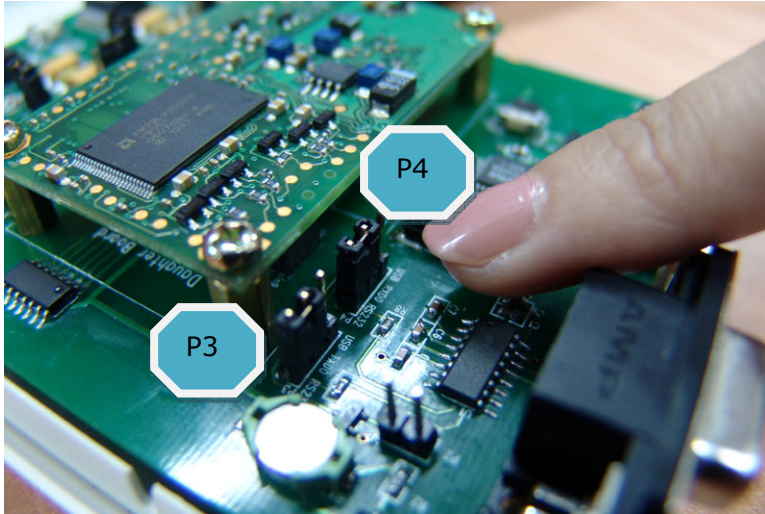


Figure 5

Jumpers - There are five user selectable jumpers on the Evaluation board. Possible placements are as follows:

Communications Jumpers

P3 (TxD SEL) and P4 (RxD SEL) configure the board to communicate either through the serial port or the USB port. To use the serial port both jumpers should be in the 'RS232' position. As you might expect, these jumpers should be moved to the 'USB' position if you plan on communicating through the USB port.

Antenna



Figure 6

The kit is supplied with Oncore™ Gold GPS Active Antenna for the M12M Timing/Navigation Oncore™.



Figure 7

Oncore™ Gold GPS Active Antenna

The specification of the above active antenna can be found [here](#) or visit http://www.ilotus.com.sg/index.php?option=com_content&task=view&id=45&Itemid=62

Initial Hardware Checkout

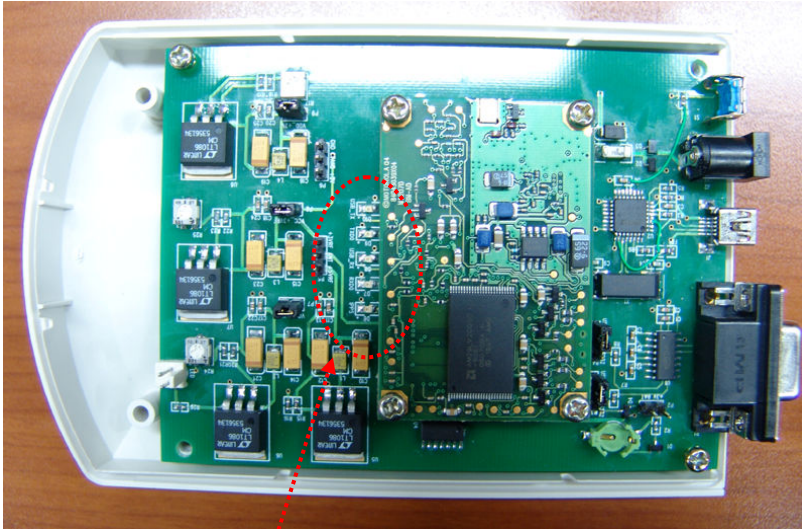


Figure 8

Illuminating LED's

M12M Timing/Navigation Oncore™ Evaluation Board - Upon the application of power, The POWER and 1PPS LED's should illuminate. Other LED's (usually TXD0 and USB TX) may turn on and stay turned on until the "@@Ha01" command is sent to the receiver (Refer page 21 for more details). Once the "@@Ha01" command is sent to the receiver is pressed, the TxD0 LED should start flashing constantly, indicating that the M12M Timing/Navigation Oncore™ is attempting to find the host system and be 'discovered' by the SiRFOncore program. This LED will continue to flash until SiRFOncore is installed and the ports are set up properly. Note that if you have selected the USB interface using the P3 and P4 jumpers that the USB TX LED will also be flashing.

It is worth noting that for the previous step to be completed successfully, the M12M Timing/Navigation Oncore™ receiver does not need to be receiving data from the GPS satellites. In fact, the antenna doesn't even need to be connected in order to have the receiver initialize. Naturally, this isn't a very useful state of operation, but if the LEDs are flashing as indicated above you can be fairly sure that the Evaluation Board and M12M Timing/Navigation Oncore™ are operational and ready for use.

Installing and Configuring SiRFOncore and Windows™

When you first run the executable, the installer will by default install SiRFOncore into this directory:
C:\Program Files\SiRF\SiRFOncore

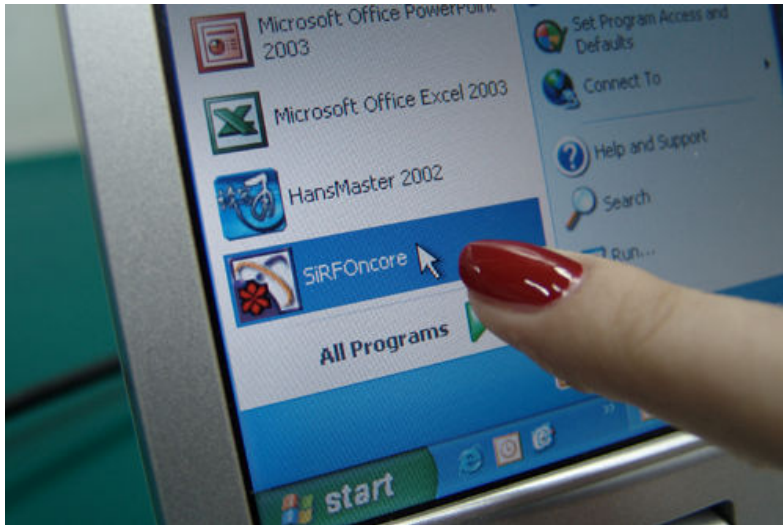


Figure 9

Installing the USB-Serial Driver

If you are going to communicate with the Evaluation Board through the USB port you will have to install the driver for the FTDI USB-to-Serial converter present on the Evaluation Board. Installation of this driver is outlined below. The following screen shots were taken on a Windows™ 2000 machine.

With this driver installed the M12M Timing/Navigation Oncore™ will appear to your computer as a standard serial device communicating through a COM port. To install the driver follow these steps:

1. Make sure both the TXD SEL and RXD SEL jumper strips on the M12M Timing/Navigation Oncore™ Evaluation Board are in the 'USB' position

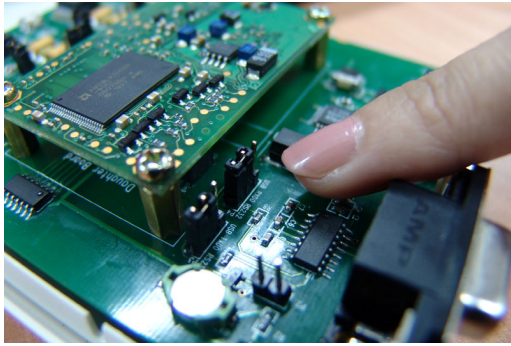


Figure 10

2. Connect the M12M Timing/Navigation Oncore™ Evaluation Board to your computer using the supplied USB cable.



Figure 11, Step A



Figure 12, Step B



Figure 13, Step C

3. As soon as the USB cable is plugged in the Windows Hardware Installation wizard should start.



Figure 14

4. Follow the prompts to install the driver.

Running SiRFOncore and the M12M Timing/Navigation Oncore™

Configuration

Assuming your computer is already booted, start SiRFOncore v3.0.

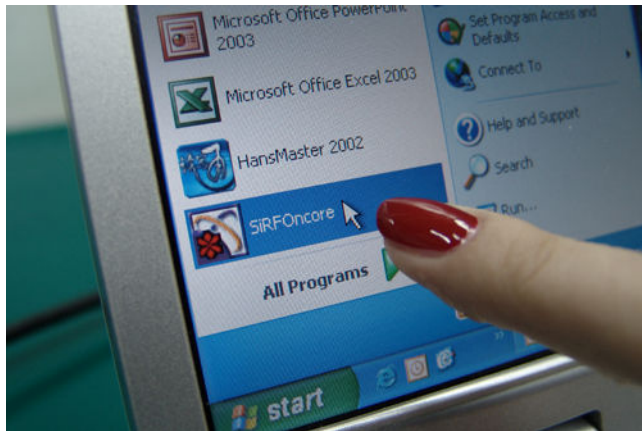


Figure 15

Opening Screen - On your computer screen, SiRFOncore should be displaying a screen that looks something like this:

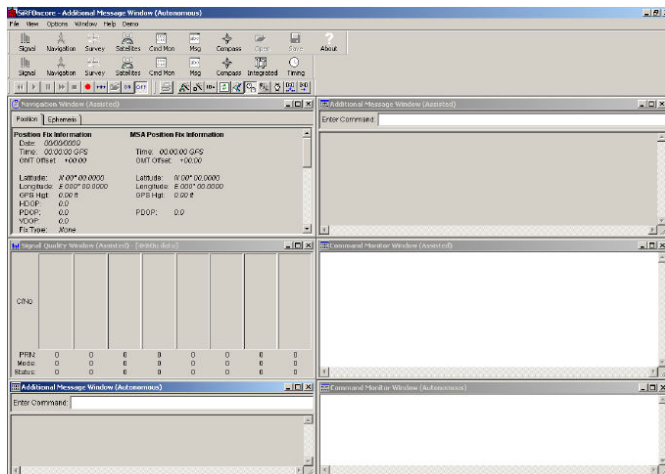


Figure 16

The top row of icons (Signal, Navigation, etc.) are associated with the M12M Timing/Navigation Oncore™. If desired, you can close the "Additional Message Window (Autonomous)" and the "Command Monitor Window (Autonomous)" as these are not used in this version of the Evaluation Kit.

COM Port Setup

Com Port Setup - You will now need to check and see where Windows™ has installed the FTDI USB-to-Serial chip driver. To do this, go back to your Desktop, click on <Settings>, and then <Control Panel> as shown below.

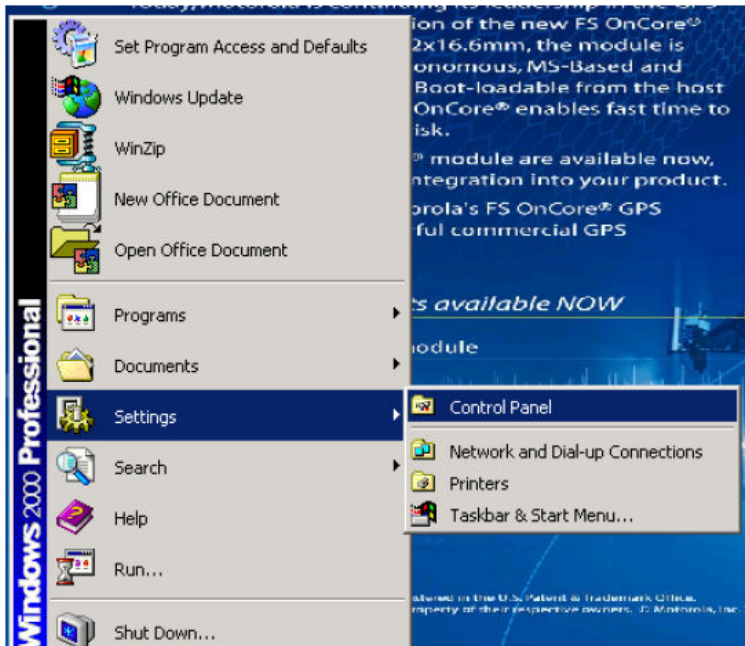


Figure 17

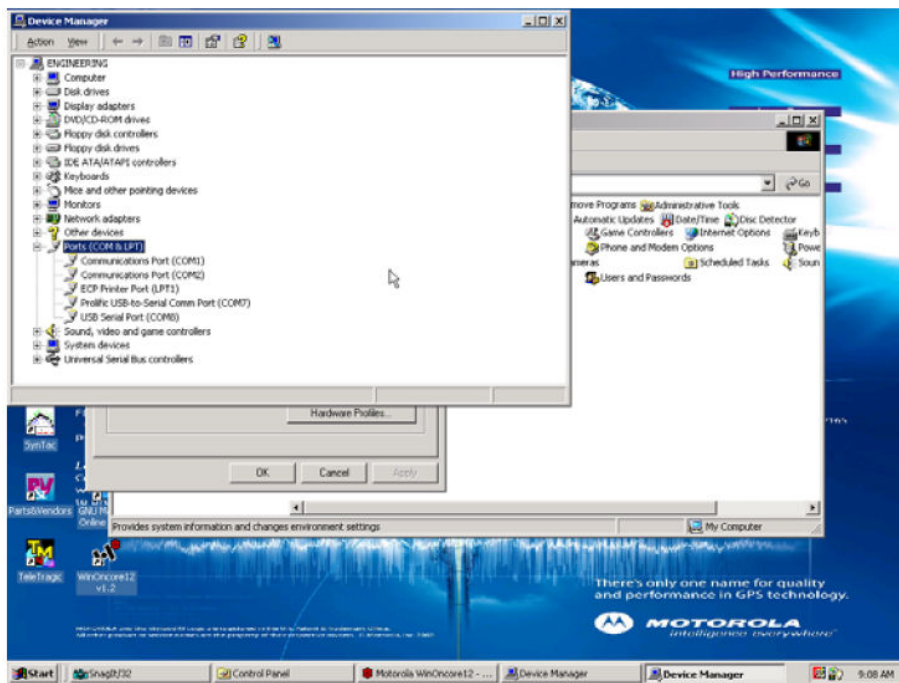


Figure 18

Once the Control Panel is open, click on the <System> icon, and then select <Hardware> from the 'System Properties' dialog box. Click on <Device Manager> in order to get to the hardware breakdown for your computer. If you open up the 'Ports (COM and LPT)' section you should see where your COM ports and the USB-to-Serial devices are installed. A typical display is shown above:

COM Port Setup (Continued...)

As you can see, the FTDI USB-Serial port chip on the M12M Timing/Navigation Oncore™ board has been assigned COM9.

This is what SHOULD happen. Occasionally, Windows™ seems to assign totally random COM port numbers to the USB adapters when they are installed, especially if you have installed other hardware in the past. This is OK as long as you check to make sure which ones are being used, but one thing to watch out for is if Windows™ assigns COM ports higher than COM8 to the USB adapters as SiRFOncore will only recognize COM ports COM8 or lower. If your USB adapter gets assigned COM9, COM10, etc., you will need to dig a little deeper into Windows and manually change the port assigned to it. This condition is shown below.

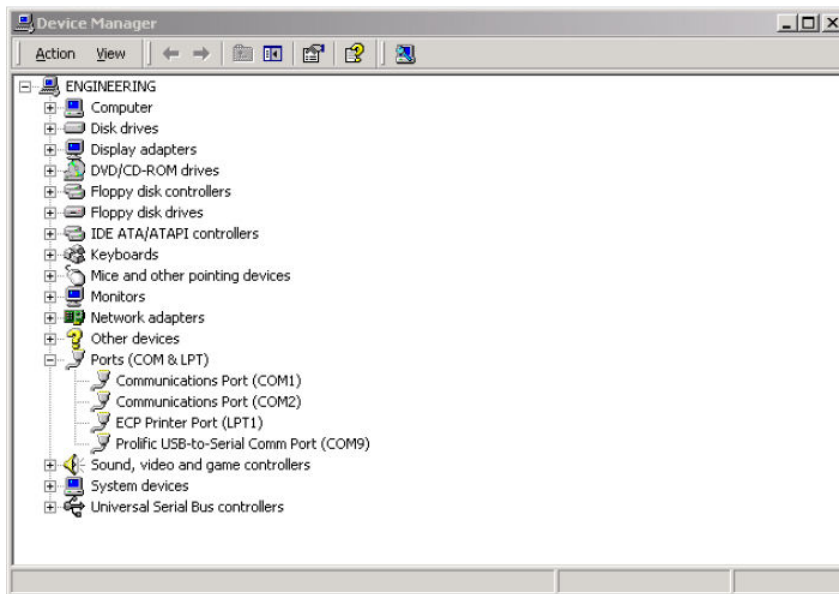


Figure 19

COM Port Setup (Continued...)

First, right click on the <USB-to-Serial COM Port (COM9)> line in the device manager, and then click on <Properties>. Next, click on <Port Settings> and then <Advanced>. You should see a screen that looks similar to this:

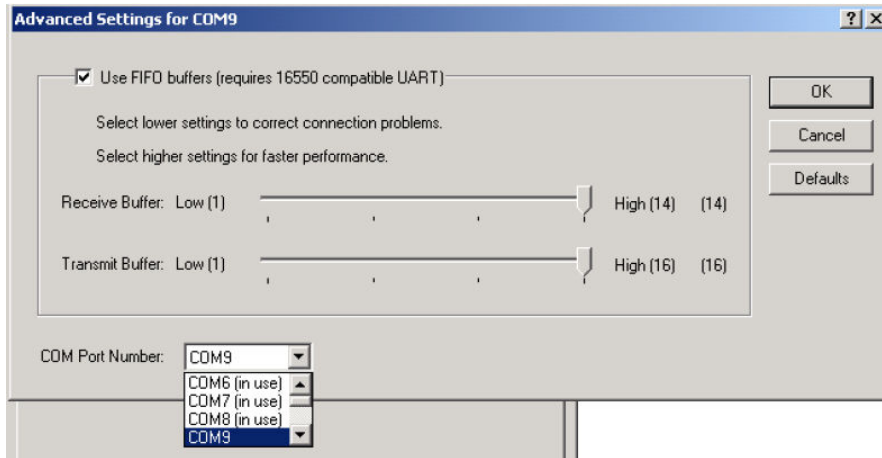


Figure 20

As you can see, Windows has assigned COM9 to the USB-to-Serial converter and is insisting that COM Ports 1-8 are all in use, even though the only COM ports on this particular computer are COM1 and COM2. To fix this, simply click on a lower numbered COM port (usually use 7 and 8 for the M12M Timing/Navigation Oncore Evaluation Kit), and then click OK.

COM Port Setup (Continued...)

If you happen to be the proud owner of a computer that REALLY has COM ports 1-8 in use (or the memory locations normally assigned to them), you cannot just go in and assign the USB -> serial to one of these without compatibility problems. Since SiRFOncore will not recognize anything higher than COM8 my suggestion is to see if you can assign some of your other COM ports to higher numbers and make sure that the USB -> serial is not assigned to ports higher than COM8.

Once the COM port assignments have been dealt with we can configure SiRFOncore to use them. On the top toolbar under <Options> select <Communications> and then <PC Communications...>. You should get a window that looks like this:

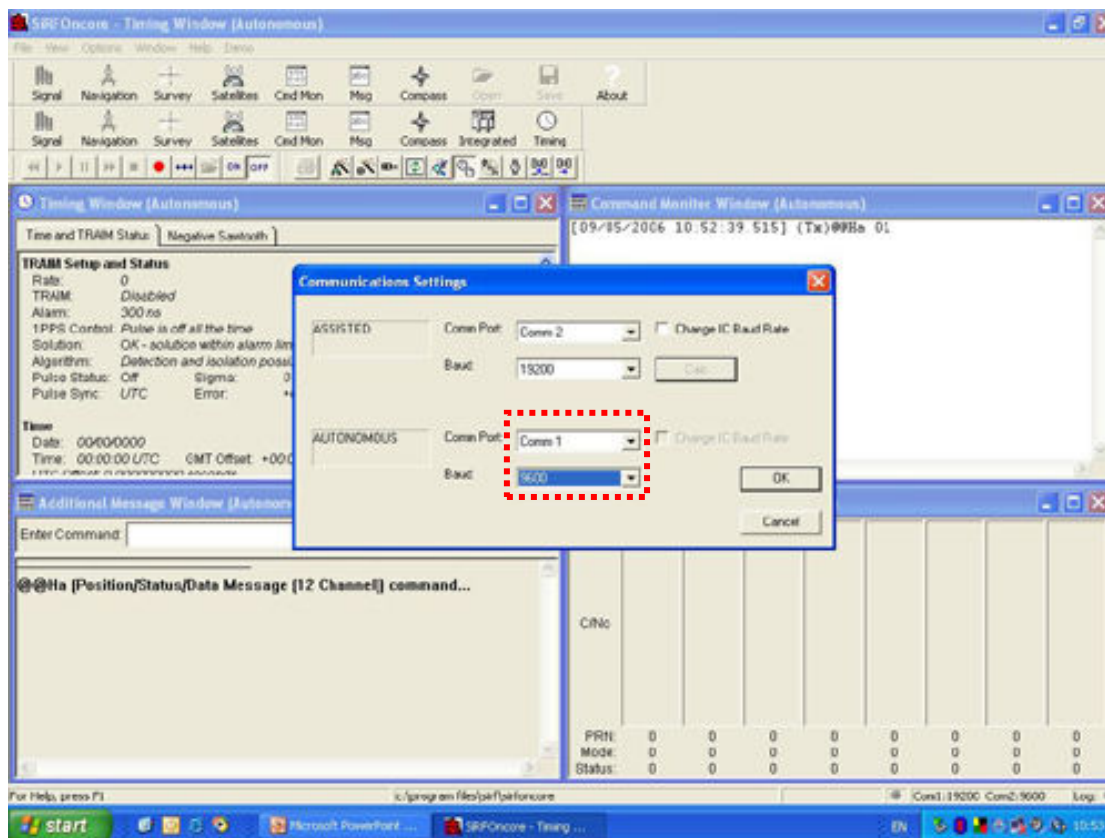


Figure 21

As you can see, the top half of the window controls communications to the "Assisted" device, which in this case is not for M12M Timing/Navigation Oncore™. The bottom half is assigned to the "AUTONOMOUS" M12M Timing/Navigation Oncore™, which is used in this kit. Default baud rates should already be set at 9200 for the M12M Timing/Navigation Oncore™. Do not change the baud rates. Make sure that the COM Ports agree with the selections made previously and then click on <OK>.

Getting Autonomous Position Fixes

Now we are going to request position fixes from the M12M Timing/Navigation Oncore™. The M12M Timing/Navigation Oncore™ can be set up to deliver data in either SiRF Binary or NMEA formats.

Enter "@@Ha01"

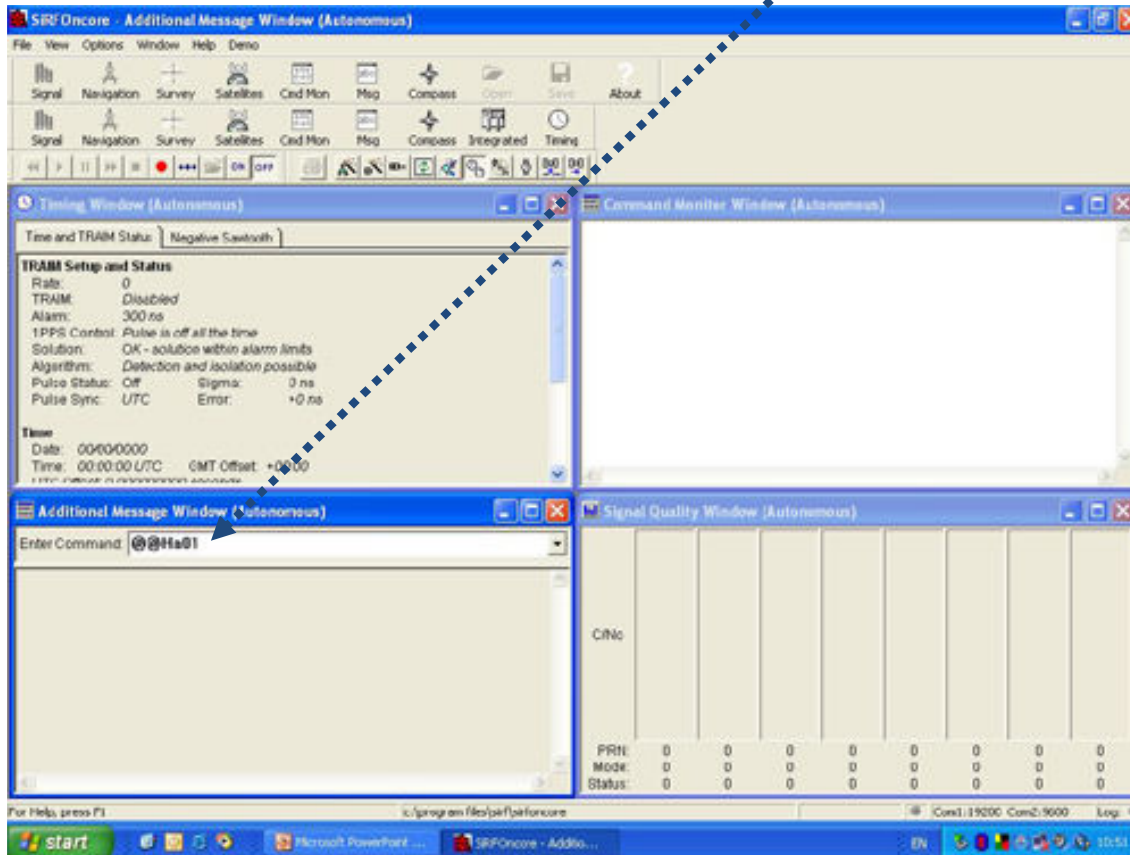


Figure 22

Getting Autonomous Position Fixes (Continued...)

Now we are going to request position fixes from the M12M Timing/Navigation Oncore™. The M12M Timing/Navigation Oncore™ can be set up to deliver data in either SiRF Binary or NMEA formats.

Messages in SiRF Binary Format

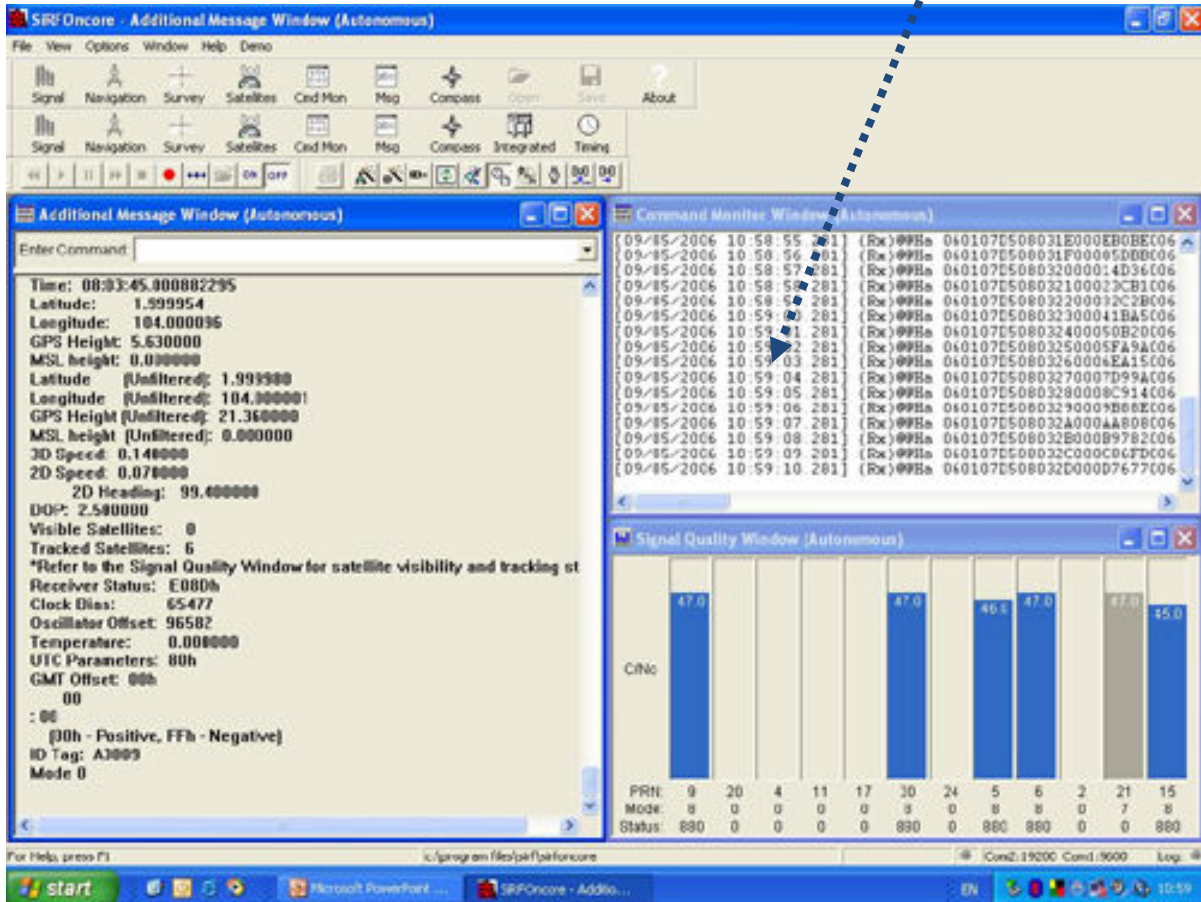


Figure 23

Evaluation Kit Jumpers

<i>Jumper</i>	<i>Description</i>
P2	Select back-up battery power supply option to M12M Oncore™. Not applicable for FC Oncore™
P3	Select serial port/USB, used by M12M Oncore™ and FC Oncore™
P4	Select serial port/USB, used by M12M Oncore™ and FC Oncore™
P5	+3v/+5v Antenna supply voltage. The M12M Oncore™ evaluation kit contains the 5VDC to 3VDC regulator circuit. The on-board jumper allows to use with either a 3VDC or 5VDC GPS antenna for M12M Oncore™, -3v/+5v Antenna supply voltage. The M12M EVK contains the 5VDC to 3VDC regulator circuit. The on-board jumper allows to use with either a 3VDC or 5VDC GPS antenna for M12M Oncore™.
P6	If the position of the jumper is set to "+3V" or jumper is removed completely from the pin, you can download firmware from flash. If the position of the jumper is set to "GND", you are able download firmware from host computer. This is only applicable for FC Oncore™.
P7	This jumper is used for connecting the core supply (Vcc_+3V) to power management device. Backup current can be measured by inserting a current meter between the P7. Normally a jumper is needed on P7.
P8	1x2-pin jumper can be used for RF supply (Vcc_+3VRF) current measurement. Remove jumper and insert a current meter for doing current measurement. Insert the jumper for normal operation.
P9	1x2-pin humper can be used for Second power supply (Vdd_+2V) current measurement. Remove jumper and insert a current meter for doing current measurement. Insert the jumper for normal operation.

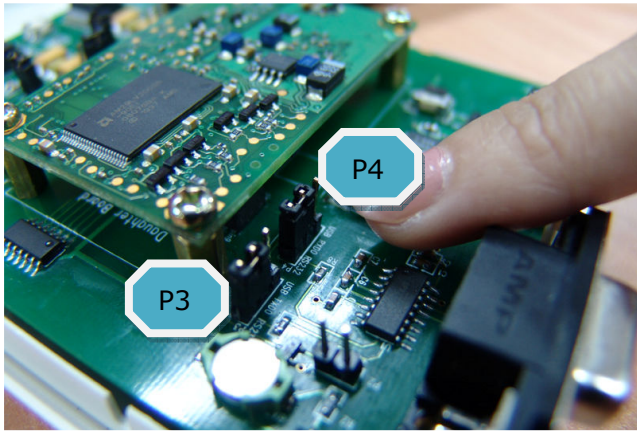


Figure 24

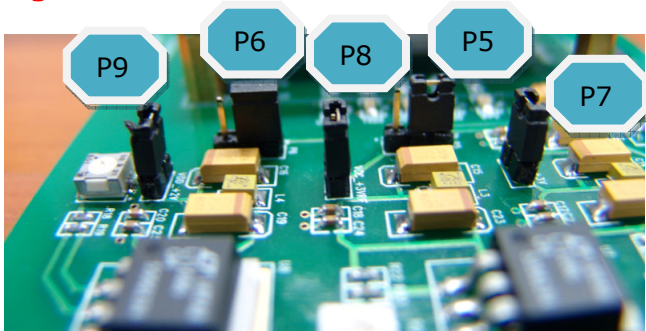


Figure 25

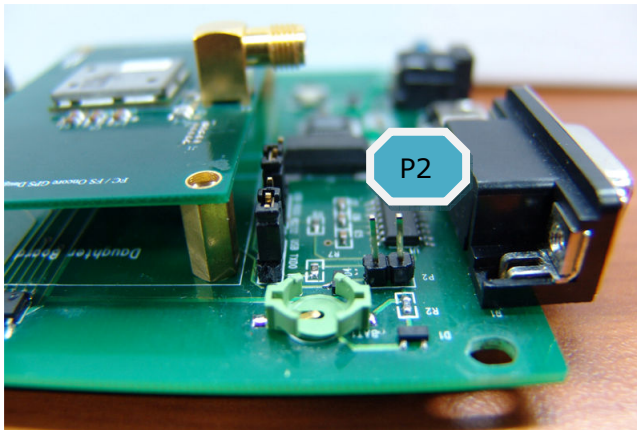
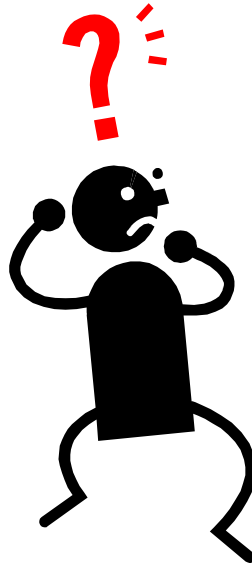


Figure 26

Question Time



This concludes the Quick-Start Guide. If you come up with ANY questions or problems in operating the M12M Timing/Navigation Oncore™ and/or the Evaluation Kit, please do not hesitate to contact us.

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