

## Multi-Vendor GPS Plug & Play with Temex Smart SRO Rubidium SynClock+<sup>®</sup>

### Powerful GDK-1 Designer Kit Enabling Multi-Vendor GPS Plug & Play Performance Assessment with Temex Smart SRO-100 Rubidium SynClock+<sup>®</sup>

## SmarTiming+<sup>™</sup> Technology INSIDE

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#### Introduction

The patented SynClock+<sup>®</sup> is the industry's first smart Rubidium clock, integrating a host of complex timing and synchronization functions all in one low-cost, ultra-small package. It intelligently synchronizes, disciplines and controls any Stratum-1 reference such as GPS, Cesium, Hydrogen Maser, and T1/E1 at cutting-edge 1ns (nanosecond) resolution. The SynClock+<sup>®</sup> utilizes SmarTiming+<sup>™</sup> technology to perform the following functions, which were previously implemented externally on a separate circuit board:

- Multi-vendor GPS interface with auto-adaptive reference filtering, disciplining, control, and Time RAIM/Position Hold signal optimization
- Auto-adaptive Stratum-1 reference disciplining and jitter/wander/noise filtering between 0-100,000 at 1ns resolution, exceeding MTIE/TDEV G.823/T1.101 standards for T1/E1 reference
- Auto-adaptive frequency stability over fast temperature changes at 0.1°C resolution
- Auto-adaptive frequency stability over temperature range within 2E-11
- Programmable 1PPS output phase/time offset adjustments between 0-1 sec through a 1ns-phase comparator
- Programmable or hardware Sync/Track setting mode to either a) phase align 1PPSout from a 1PPS GPS reference through the Sync mode or b) to frequency track 1PPSout from a 1PPS Stratum-1 reference through the Track mode
- Programmable EEPROM for TIE performance measurements, frequency calibration and backup setting in case of power failure, and seamless software upgrades
- Standard RS-232 communication interface with user-friendly ASCII commands for control, configuration, fault, and performance management

The purpose of this AppNote is to show engineers that it is possible today thank the Temex Time GDK SynClock+<sup>®</sup> designer kit to really plug and play with the most common GPS receivers for timing available on the market.

### Validity

The information given hereafter is for the designer kit GDK1. PCB: "X1-Y003C Release 22.4.2004". SynClock+® : SRO-100; Software: Vers 1.09.

### Motorola UT+ Oncore Installation



Figure 1 – Installing Motorola UT+ Oncore on the GPS Interface Board

Spacer: Øint.: 3.5 mm, Øext.: 6 mm, height: 10 mm, plastic (4).

Screw: M3, length: 17 mm (4).

Nuts: M3 (4).

Normally the antenna connector is a standard MCX.

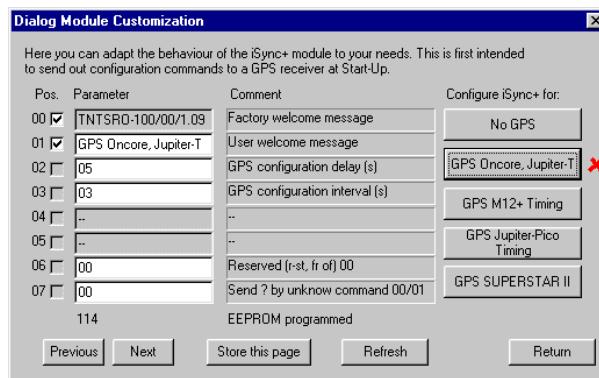


Figure 2 – Configuring Motorola GPS at Start Up with iSyncMgr.exe (Version 1.09)

With iSyncMgr.exe, Timing+Tracking / MCsxx.. this windows pops up and the SRO can be configured so it will send out messages to the Oncore at Start up. These messages will configure the Oncore for optimum timing conditions.

#### Tips:

- The spacers for the Jupiter-T (Standard package) can also be used for the Oncore. The outside diameter is may be a little to big.
- For the antenna cable, an MCX <-> SMA adaptor can be found by Huber&Suhner. 33 MCX-SMA-50-1/111 UE. Order under: 22645487.

#### Remark:

- Motorola announced that this product is no longer manufactured on Oct 19, 2005

## Navman Jupiter-T Installation



**Figure 3 – Installing Navman Jupiter-T on the GPS Interface Board**

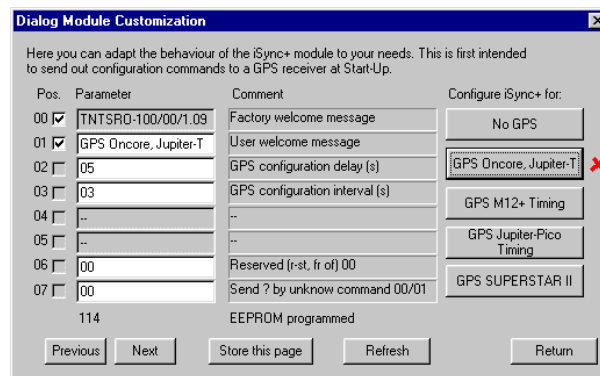
Spacer: Øint.: 3.5 mm, Øext.: 7 mm, height: 11 mm, plastic (4).

Screw: M3, length: 17 mm (4).

Nuts: M3 (4).

Normally the antenna connector is a standard MCX.

The designer kits are delivered with this Jupiter-T receiver in standard.



**Figure 4 – Configuring Navman GPS at Start Up with iSyncMgr.exe (Version 1.09)**

With iSyncMgr.exe, Timing+Tracking / MCsxx.. this windows pops up and the SRO can be configured so it will send out messages to the Jupiter-T at Start up.

These messages will configure the Jupiter-T for optimum timing conditions.

Tips:

- For the antenna cable, an MCX <-> SMA adaptor can be found by Huber&Suhner. 33 MCX-SMA-50-1/111 UE. Order under: 22645487.

## Motorola M12+ Timing Installation



Figure 5 – Installing Motorola M12+ Timing on the GPS Interface Board

Spacer: Øint.: 3.5 mm, Øext.: 5 mm, height: 3.5 mm, plastic (4).  
Screw: M3, length: 10 mm (4).  
Nuts: M3 (4).  
Normally the antenna connector is a MMCX.

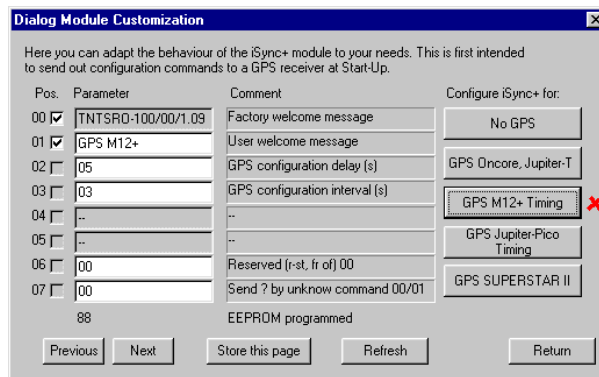


Figure 6 – Configuring Motorola GPS at Start Up with iSyncMgr.exe

With iSyncMgr.exe, Timing+Tracking / MCsxx.. this windows pops up and the SRO can be configured so it will send out messages to the M12+ Timing at Start up. These messages will configure the M12 for optimum timing conditions.

Tips:

- For the antenna cable, an MMCX <-> SMA adaptor can be found by Huber&Suhner. 33 MMCX-SMA-50-1/111 UE. Order under: 952285. Unfortunately, the adaptor is to big. It is suggested to untied a little the screws on the antenna connector side of the PCB during the trials with this adaptor.

Remark:

- Motorola announced that this product is no longer manufactured on Oct 19, 2005

## Navman Jupiter Pico T Installation



Figure 7 – Installing Navman Jupiter Pico T on the GPS Interface Board

Spacer: Øint.: 2.2 mm, Øext.: 4 mm, height: 4 mm, plastic (3).

Screw: M2, length: 10 mm (3).

Nuts: M2 (3).

Normally the antenna connector is a Hirose type H.FL.

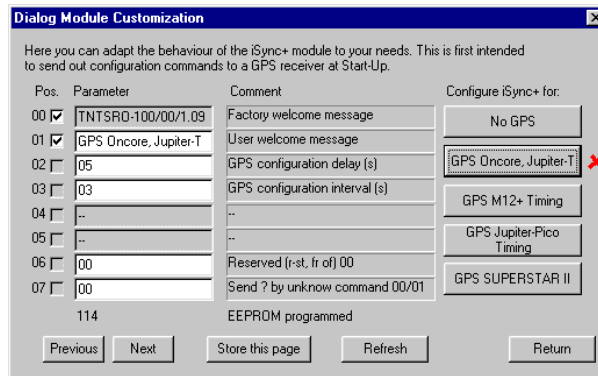


Figure 8 – Configuring Navman GPS at Start Up with iSyncMgr.exe

With iSyncMgr.exe, Timing+Tracking / MCsxx.. this windows pops up and the SRO can be configured so it will send out messages to the Jupiter Pico T at Start up.

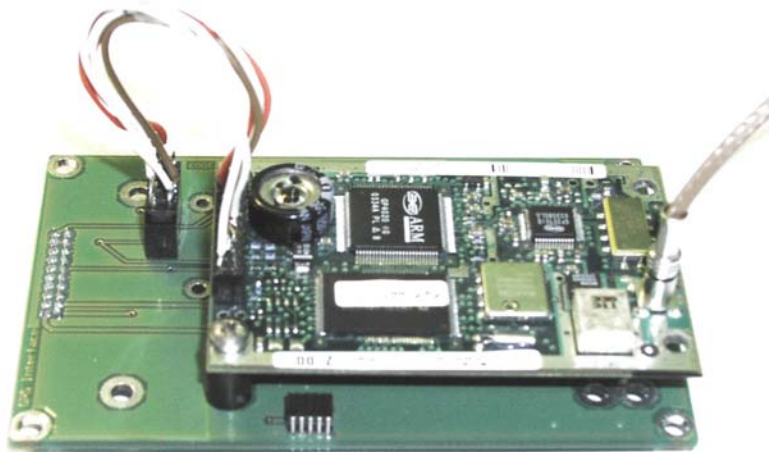
These messages will configure the Jupiter Pico T for optimum timing conditions.

Remark: iSyncMgr.exe Version 1.09. Don't click on the button "GPS Jupiter\_Pico Timing". It's an incorrect labeling, which will be corrected soon. In fact this button disables the receiver to send data over the Navman's Zodiac binary protocol.

### Tips:

- To connect a GPS antenna cable to the Hirose H.FL connector of the receiver is not so easy. USA users may try to order the cable assembly proposed by Digikey. Part No: 229-1006-ND.

## Novatel SuperStar II Installation



**Figure 9 – Installing Novatel SuperStar II T on the GPS Interface Board**

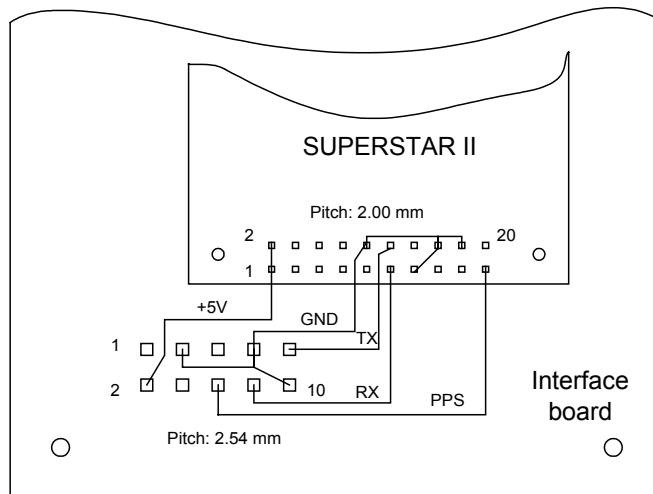
This installation is a bit tricky. The receiver is attached to the interface board with only 2 screws. For the electrical interface, a cable must be made especially.

Spacer: Øint.: 3.5 mm, Øext.: 7 mm, height: 11 mm, plastic (2).

Screw: M3, length: 17 mm (2).

Nuts: M3 (2).

Normally the antenna connector is a standard MCX.



**Figure 10 – Wiring Diagram between SUPERSTAR II & Interface board**

Name	Board side 10 pins male connector	GPS side 20 pins female connector
+5 Volt	2	1,2
GND	3,7,10	10,13,16,18
PPS	6	19
TX	8	11
RX	9	12

**Table 1 – Interface Cable**

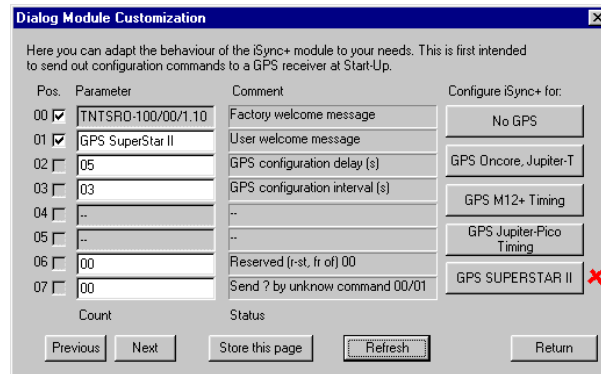


Figure 11 – Configuring Novatel GPS at Start Up with iSyncMgr.exe

With iSyncMgr.exe, Timing+Tracking / MCsxx.. this windows pops up and the SRO can be configured so it will send out messages to the SuperStar II at Start up. These messages will configure the SuperStar II for optimum timing conditions.

Tips:

- For the antenna cable, an MCX <-> SMA adaptor can be found by Huber&Suhner. 33 MCX-SMA-50-1/111 UE. Order under: 22645487.

**Fast Q&A Support**

If you have any questions about this AppNote or need tech support with your specific timing design and requirements, please feel free to contact us at [fastsupport@temex.com](mailto:fastsupport@temex.com).

**Ordering Temex Smart SynClock+®**

If you are interested in ordering these parts:

- Smart SynClock+®.
- GPSR/X JSDK designer kit.

Please contact us at [sales@temex.com](mailto:sales@temex.com).

For ordering a GPS receiver for timing, you may browse the internet every 6 months as the market offerings change often in the GPS industry.