

Zyfer

CommSync II

Modular Time & Frequency System

- Simple
- Flexible
- Upgradable
- Maintainable
- Redundant
- Hot Swappable



Made in the U.S.A. by

Zyfer
AN ODETICS COMPANY

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CommSync II Benefits

- Redundant time and frequency sources
- Automatic switchover in the event of a failure
- Increased reliability due to fewer system components
- Increased reliability due to fewer connection cables
- Shorter MTTR due to "hot swappable" spare modules
- Decreased power consumption
- Lower field maintenance costs due to less system complexity
- Lower training costs due to single system

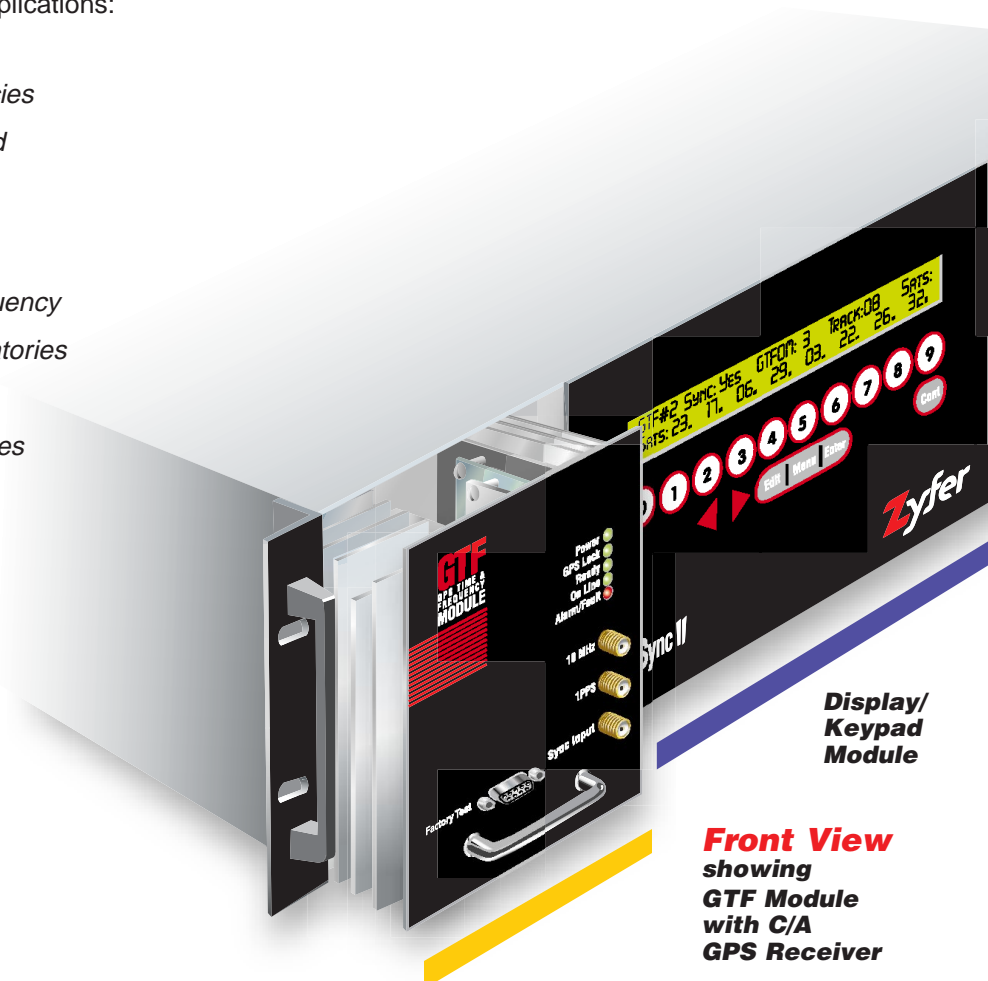
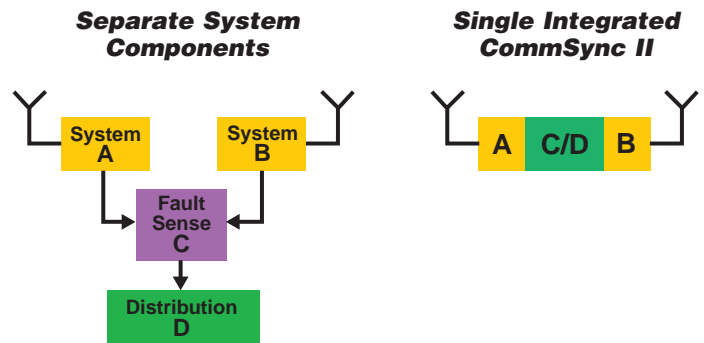
CommSync II Applications

The unparalleled flexibility of the CommSync II system allows it to be used in almost any time & frequency application. It has already gained popular acceptance in these industry applications:

- Ultra low phase noise outputs for generation of baseband frequencies
- As a replacement for CDS-10 and CDS-20 systems
- Telecommunications network synchronization
- Test range primary time and frequency
- Standards and calibrations laboratories
- Satellite ground station timing
- Military and governmental agencies secure communications

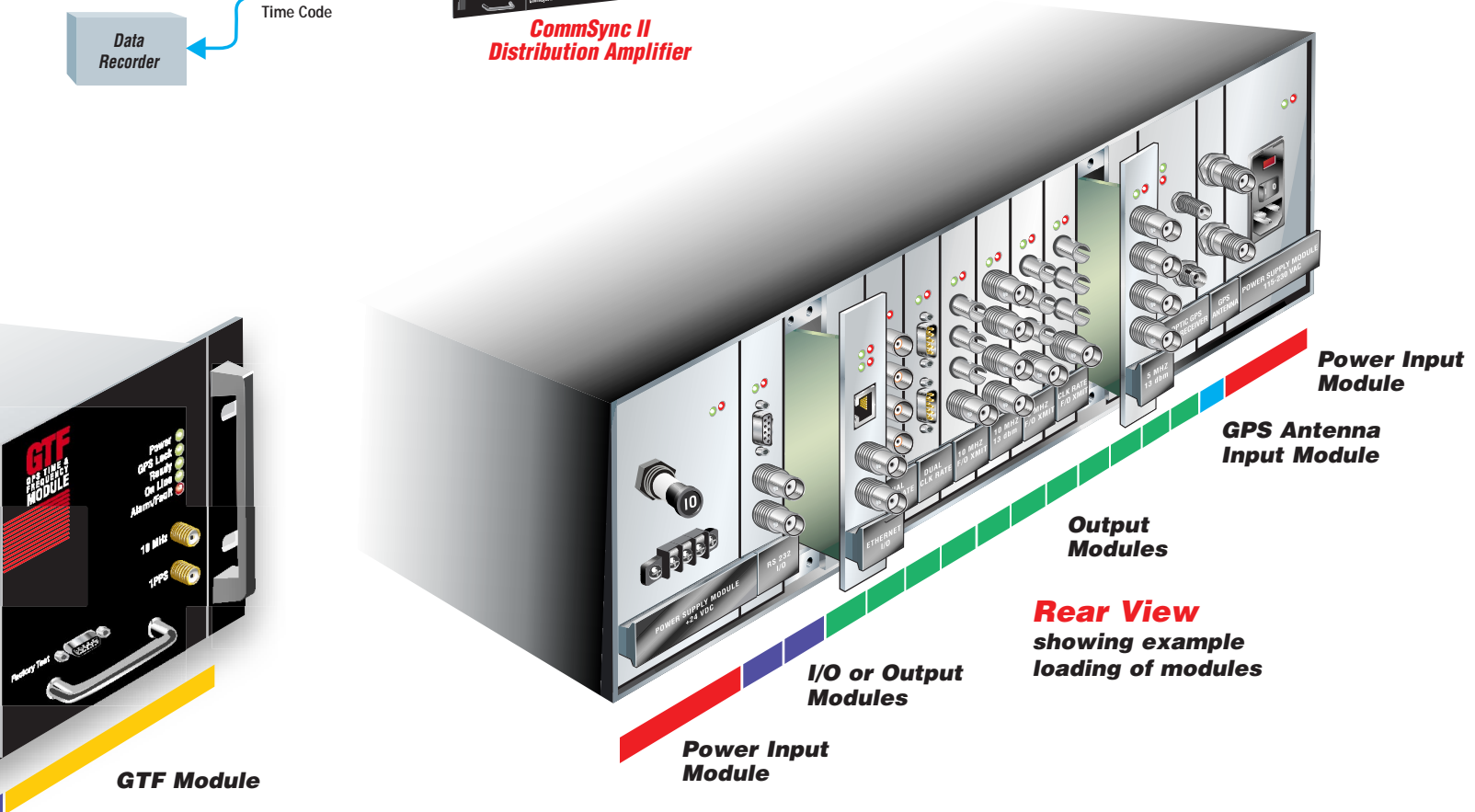
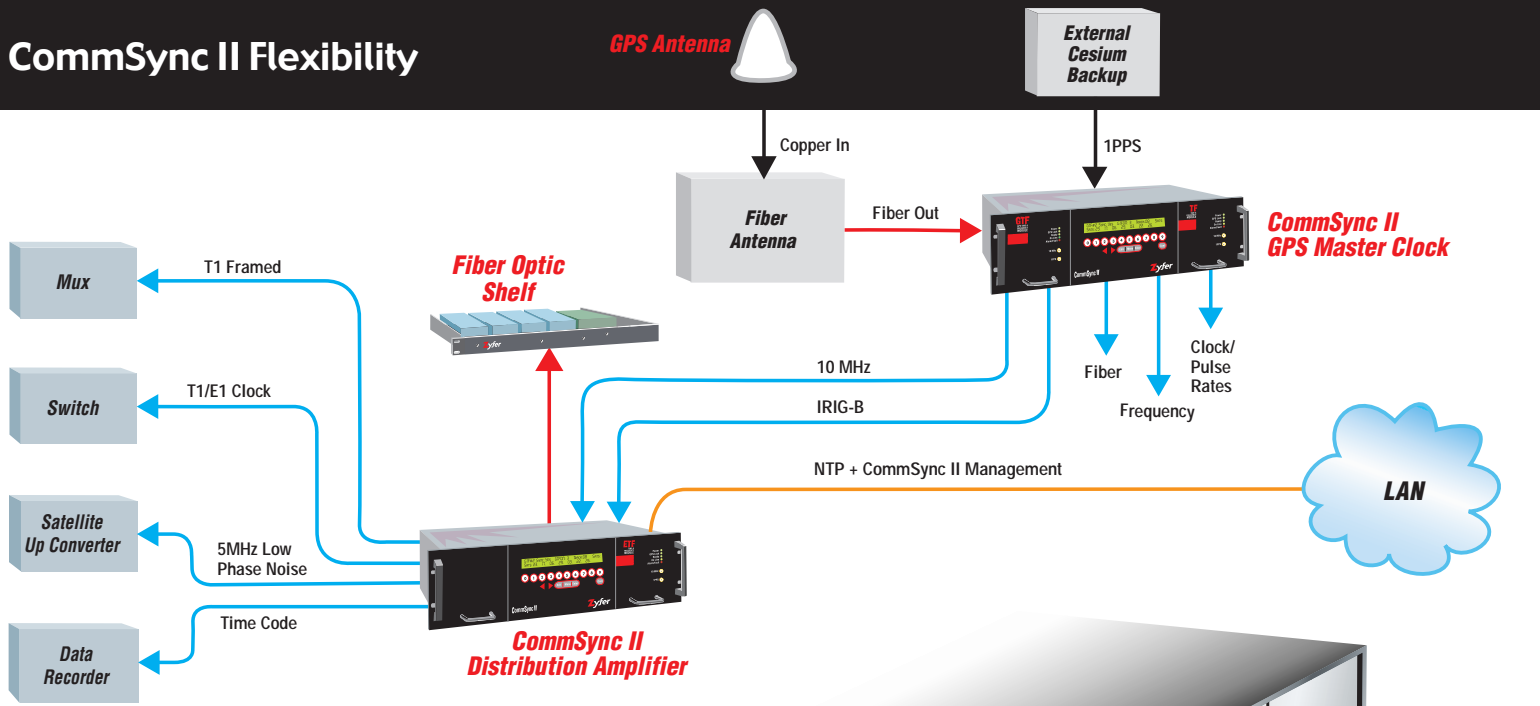
CommSync II Design Philosophy

The CommSync II system was designed to save time & money by combining elements of several systems or functionalities into one rack mount chassis. This single system approach yields unparalleled benefits compared to previous generation systems. The diagram below illustrates how multiple system elements are combined into the CommSync II to provide the benefits listed at left.



Front View
showing
GTF Module
with C/A
GPS Receiver

CommSync II Flexibility



POWER INPUT MODULES

The CommSync II can be configured with one or two power input modules of any type below. They are hot swappable and come with built in fuse protection. The AC version provides a standard IEC grounded connector and ships with a U.S. power cord.

- 115-220 VAC/DC Power Input Module
- 19-36 VDC Input Power Module
- 30-55 VDC Input Power Module

INPUT MODULES

The CommSync II will soon be more expandable with the addition of two rear-mounted external time and frequency input modules. This allows CommSync II to be disciplined to external sources or be configured as an intelligent distribution amplifier. The following types of inputs will be available:

- ◆ IRIG-B Inputs
- ◆ Fiber Optic Inputs
- ◆ 1,5,10 MHz or 1 PPS Inputs
- ◆ E1/T1 Inputs

Option Modules

SYSTEM CONTROL AND STATUS

The CommSync II controlled and monitored in several ways. Standard on most system is a LCD Display and keypad which allows users to status the system and program options. In addition, the system can be controlled and monitored using the optional RS-232 interface board or an Ethernet interface board. Up to two I/O modules of any kind can be used in a redundant system. If no I/O cards are used in the I/O slots they may be used for output modules.

- LCD Display and Keypad
- RS-232 I/O Module
- Ethernet I/O Module (Includes Telnet and NTP)
- ◆ Ethernet I/O Module (Include Telnet, HTML, FTP, e-mail and NTP)

T1/E1 OUTPUT MODULES

The T1/E1 module is designed to provide communication networks with synchronization clock signals in both an unframed and framed format. The module can produce an all ones output in either the T1/DS1 D4, T1/DS1 ESF (Extended Super Frame) or E1 formats. The module is available with the following electrical interfaces:

- T1/E1 Output Module – (4) outputs on (4) RJ-45 connectors
- T1/E1 Output Module – (4) outputs on (4) BNC connectors
- T1/E1 Output Module – (4) outputs on (2) DE-9 connectors
- T1/E1 Output Module – Wire Wrap (4 pairs of pins)

PULSE RATE OUTPUT MODULES

The dual pulse rate output modules have a programmable range of 1PPM to 10MPPS in decade steps. In addition to their wide programming range, these modules can have two independent pulse rates coming from the same board. This board can be programmed from the front panel, RS-232 or on the board through DIP switches. A fiber optic version of the board is also available. (For more information, see the Fiber Optic Shelf.) A variety of electrical interfaces are provided.

- ◆ Quad TTL 1PPS – (4) BNC connectors
- ◆ RS-422 Dual Pulse Rates –
 - (6) outputs on (2) DE-9
 - (4) outputs on (4) TRIAX connectors
- ◆ Fiber Optic Pulse Rates – (1) BNC & (3) ST connectors
- ◆ TTL Dual Pulse Rates – (4) BNC connectors

◆ ◆ ◆ **Call for availability**

TIME CODE & TOD OUTPUT MODULES

The time code module makes it easy to add one or many different time code outputs to the CommSync II. This module can output IRIG B 122 and 123, with and without straight binary seconds. In addition, IRIG A 132, NASA 36, 2137, and IEEE 1344-1995 are also available. All codes are available in AC and DC shift. This board is programmed using DIP switches.

- Time Code/RS-232 TOD Output Module –
 - (2) outputs on (2) BNC connectors
 - (1) DE-9 connector
- Time Code Output Module –
 - (4) outputs on (4) BNC connectors

FREQUENCY OUTPUT MODULES

The CommSync II 5 or 10 MHz frequency output modules are designed to provide a frequency reference output on any of the electric or optical interfaces listed below:

- Low Phase Noise Sine Wave – (8) BNC connectors
- RS-422 – (2) DE-9 or (4) TRIAX connectors
- Sine Wave – (4) BNC connectors
- TTL/ECL – (4) BNC connectors
- Fiber Optic – (1) BNC & (3) ST connectors

CLOCK RATE OUTPUT MODULES

The dual clock rate output modules have a programmable range of 8kHz-4096kHz in 8kHz steps. In addition to their wide programming range, these modules can have two independent clock rates coming from the same board. A fiber optic version of the board is also available. (For more information, see the Fiber Optic Shelf.) A variety of electrical interfaces are provided.

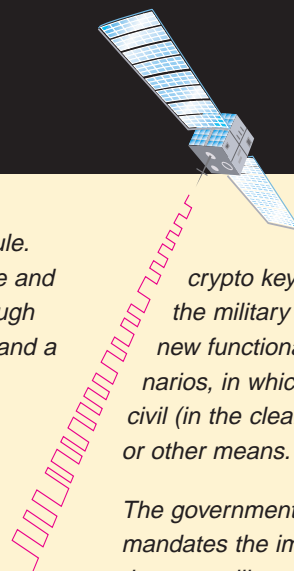
- Quad TTL 1PPS – (4) BNC connectors
- RS-422 Dual Pulse Rates –
 - (6) outputs on (2) DE-9
 - (4) outputs on (4) TRIAX connectors
- Fiber Optic Pulse Rates – (1) BNC & (3) ST connectors
- TTL Dual Pulse Rates – (4) BNC connectors

FIBER OPTIC ANTENNA MODULES

To allow for optical isolation and long antenna runs, the CommSync II can provide for Fiber Optic antenna input capability by simply adding an input module into the system as well as a roof mounted transmitter. One of each of the below modules must be ordered for each antenna installed:

- Fiber Optic Antenna Receive Module (1 module per transmitter)
- Fiber Optic Antenna Transmitter (1 external unit per antenna)

P(Y) Direct SAASM



What is SAASM?

SAASM stands for Selective Availability Anti-Spoof Module. SAASM is a new PPS GPS receiver security architecture and crypto key infrastructure. SAASM improves security through the implementation of a “tamper-resistant” GPS module and a new Black-Key crypto management system.

Initial SAASM receivers will have capability to be keyed with conventional Red-Keys. The keys are classified. However, the CommSync II becomes a controlled item and unclassified after being keyed. Current P(Y) receivers are Red-Keyed and have the logistics burden of classified key handling, storage, and disposal requirements. Black-Keys, on the other hand, are in the form of encrypted Red-Keys providing the opportunity to eliminate the logistics burden; details yet to be finalized by the government.

What is P(Y) Code Direct?

P(Y) Code is the encrypted military code that is part of the GPS signal structure. In order to receive this signal and receive accurate time and other necessary parameters, earlier GPS receivers were first required to acquire the C/A signal

before acquiring the P-Code, as well as being crypto keyed. Today, the P(Y) Direct receiver can receive the military code in the absence of the civil C/A signal. This new functionality is important in today’s tactical warfare scenarios, in which the U.S. government may choose to make the civil (in the clear) GPS C/A signal unavailable through jamming or other means.

The government document CJCSI 6140.01, OCT. 22, 1998 mandates the implementation of SAASM receivers to support the new military scenarios. The P(Y) Direct SAASM receiver to be featured in the CommSync II will support these requirements.

Benefits

- New tamper-resistant security design makes the P-Code receiver less vulnerable to compromise
- Significantly reduced logistics infrastructure for key distribution, handling, storage, and disposal
- P(Y) Direct- acquisition with either L1 or L2 carriers provides for a robust terminal, able to come on-line and operate in the absence of the civil C/A signal.



GTF Module with Direct P(Y) SAASM

GTF Modules

The GPS Time and Frequency Module (GTF Module) is the core of the CommSync II system. One or two GTF Modules can be installed into the front of the system. Each GTF is an independent Time & Frequency system that can be outfitted with a GPS receiver or without for use as a tracking oscillator module.

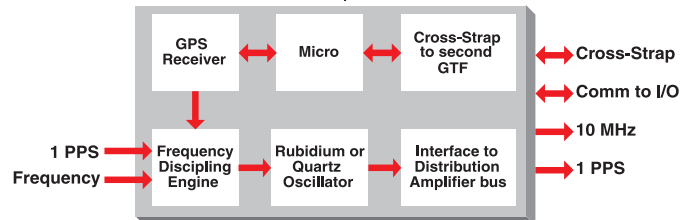
Redundant

When the CommSync II is equipped with two GTF modules, the modules automatically communicate with each other to enable a “glitch-free” switchover capability. In addition, the modules have a cross redundant capability which allows a sharing of the main GTF components (GPS receiver and oscillator) for added survivability.

Robust

GTF modules are completely enclosed for durability during field replacement or depot storage. To increase reliability the GTF modules were designed so that no cooling fans are required for normal operation. Rubidium GTF modules come with extra large heat sinks to ensure cool operation.

GTF Components



Intelligent

GTF modules use a unique **Zyfer learning algorithm** to compensate for temperature changes as well as oscillator aging when not disciplined to a GPS or external input signal.

Configurable

Each GTF comes standard with a 1,5,10MHz or 1PPS input as standard for external synchronization. A GTF can be configured with the following features:

- C/A Code GPS Receiver
- ◆ P(Y) Code SAASM GPS Receiver *
- Rubidium Oscillator
- Quartz Oscillator

◆ **Call for availability** * **See back page**

CommSync II Specifications



Physical

Height	133.5 mm (5.25")
Width (Chassis)	425 mm (16.75")
	Mounts in 19" EIA rack
Depth	302 mm (16")
Weight	20lb. Max.
Panel Color	Satin black finish (Front Panel)

Environmental

Operating Temperature	0°C to +50°C
Temperature rate of change	≤10°C/Hour
Storage Temperature	-40°C to +85°C
Humidity	5% to 95% non-condensing
Operating Altitude	-60 m to 4000 m
Storage Altitude	-60 m to 9000 m

Power

DC Input (Low Range Module)	19 to 36 VDC
	24VDC, 85W Maximum
	24VDC, 48W Typical
DC Input (High Range Module)	30 to 55 VDC
	48VDC, 85W Maximum
	48VDC, 48W Typical
AC Input (Wide Range Module)	90-240 VAC, 50-60 Hz
	115VAC 80W Maximum
	115VAC 40W Typical

Output Specification* (Drives all frequency output modules)

Accuracy Error- 24 hour average	<u>Rubidium</u>	<u>Quartz</u>
Locked to GPS	<1E-12	<1E-12
Holdover	<5E-11	<1E-10
Short Term Stability	<3E-11	<1E-11 (1 sec tau)
	<1E-11	<1E-11 (10 sec tau)
	<3E-12	<1E-10 (100 sec tau)

Phase Noise (5MHz Module/ Quartz GTF)

	<u>Standard</u>	<u>Low Phase Noise</u>
1 Hz	85	105
10 Hz	100	130
100 Hz	120	143
1 KHz	120	153
10 KHz	145	155

1 PPS (Drives all rate output modules)

Accuracy Error**	<u>Rubidium</u>	<u>Quartz</u>
Locked (SPS)	≤100ns to UTC	≤100ns to UTC
Locked (PPS)	≤50ns to UTC	≤50ns to UTC
Holdover *	≤±3µs per 24 hrs.	≤±7µs per 24 hrs.

* After 48 hours of locked operation, fixed antenna location, and antenna delays entered.

** 95% probability

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GPS Receiver Options

Standard SPS GPS Receiver

Type	8 channel, independent tracking	
Frequency	1,575.42 MHz (L1)	
Code	C/A only	
Acquisition Time	Warm Start:	<2 min.
	Cold Start:	<20 min.

P(Y) SAASM PPS Option *

Type	12 channel, independent tracking	
Frequency	1,575.42 MHz and 1,227.6 MHz (L1 & L2)	
Code	C/A and P(Y)	
Acquisition Time	Warm and cold start: <1 min. C/A to P(Y)	
Key Load Interfaces	KYK-13 (Red and Black key capable)	
Key Loading	DS-102 or DS-101 after 48 hours	

*The sale of this module is restricted to users authorized by the U.S. Department of Defense to purchase Precise Positioning Service (PPS) GPS receivers.

Non-U.S. authorized users must purchase PPS equipment through the Foreign Military Sales (FMS) process.

CommSync II

OPTIONAL ACCESSORIES

L1 Antenna Kits
Antenna Cables

Call today for a
CommSync II
configuration guide
800-374-4783