



Miniature Multi-GNSS Timing Module with Super-Sized Features

## ICM SMT 360 Multi-GNSS Timing Module

### Ideal for Low Signal Environment

Protempis designed the ICM SMT 360™ Timing Module to work in the most demanding weak signal environments, including femtocells and in-building systems.

With its robust performance in low signal environments, users can save on expensive cabling and externally mounted antennas. In addition, the ICM SMT 360™ timing module accepts aiding data for environments requiring the highest levels of enhanced sensitivity.

### PPS and Frequency Outputs

The ICM SMT 360™ timing module outputs a precise 1 pulse-per-second (1PPS) and 10 MHz frequency to maximize your network performance and synchronize systems at a global level. Custom frequencies are also available for volume sale.

### Standard Timing Features

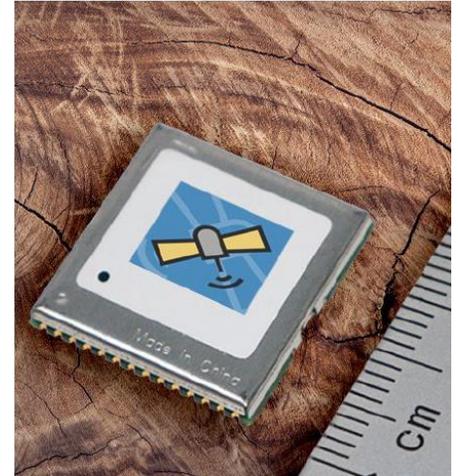
The ICM SMT 360™ timing module includes many of Protempis' standard timing features, including Time-Receiver Autonomous Integrity

Monitoring (T-RAIM) algorithm, automatic self-survey, and GNSS disciplining of the oscillator to provide an accurate frequency reference.

### Carrier Board and Starter Kit Options

The ICM SMT 360™ timing module can be loaded directly onto the customer's application board.

The Starter Kit provides everything you need to evaluate the ICM SMT 360™ timing module, including the ICM SMT 360™ on a carrier board, AC/DC power converter, antenna and USB interface cable.



### Key Features

- Multi-Constellation
- Simultaneous GPS / GLONASS or GPS / Beidou tracking
- Ideal for populated urban and indoor environments with limited sky-view
- Holdover:
  - ±7us over 5-minute period (min. 1-hour learning)
  - 100ppb over 24 hours
- PPS, PP2S and 10MHz output (Custom frequencies available)
- Extended temperature range (-40°C / +85°C)

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## General Specifications

Receiving Signal.....GPS, GLONASS, Galileo, Beidou  
 Supports GNSS incl. .... QZSS  
 Positioning System.....SPS, Timing  
 1 PPS Timing Accuracy .....15 ns (1 sigma) @ room temp  
 Holdover Stability.....<±7us over 5 min period  
 (Min. 1hr learning)  
 (100ppb over 24hrs.)  
 Update Rate.....1 Hz  
 Typical Min Acq Sensitivity..... -148dBm cold start  
 Typical Min Tracking Sensitivity ..... -162dBm  
 Time to First Fix1.....<46s (50%), <50s (90%) cold start  
 Typical Time to Re-acquisition..... <2s (90%)

## Interface Characteristics

Serial Port.....2 serial port  
 PPS / Even Second.....CMOS-compatible  
 LVTTTL-level pulse, once per second  
 Protocols.....TSIP, NMEA 0183

**The performance criteria and times given for TTFF & reacquisition are with GPS satellites in the constellation set.**

## Pinout Assignments

ICM-SMT 360 PINOUTS

1	GND	GND	28
2	GND	VCC	27
3	RFIN	GND	26
4	GND	EXTRESET	25
5	OPEN	GND	24
6	SHORT	SYSCLK	23
7	NC	TXD2	22
8	NC	RXD2	21
9	NC	GND	20
10	NC	1PPS	19
11	PPS_IN (ICM Only)	GND	18
12	NC	TXD	17
13	NC	FXD	16
14	GND	GND	15

Enclosure.....Metal Shield  
 Dimensions 19 mm W x 19 mm L x 2.54 mm H  
 (0.75" W x 0.75" L x 0.1" H)  
 Weight.....1.8 grams (0.06 ounce)  
 (Including shield)

## Electrical Characteristics

Supply Voltage Range.....3.3VDC to ±5%  
 Power Consumption.....0.5W max.

## Environmental Specifications

- Operating temp.-40 °C to +85 °C
- Humidity 5%-95% RH (non-condensing)

## Phase Noise

Maximum, over temperature range:

- 100dBc/Hz @ 100Hz
- 120dBc/Hz @ 1KHz
- 135dBc/Hz @ 10KHz
- 140dBc/Hz @ 100KHz

Typical:

- 105dBc/Hz @ 100Hz
- 125dBc/Hz @ 1KHz
- 140dBc/Hz @ 10KHz
- 145dBc/Hz @ 100KHz

Please go to [www.protempis.com](http://www.protempis.com) for the latest documentation and tools, part numbers and ordering information.

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