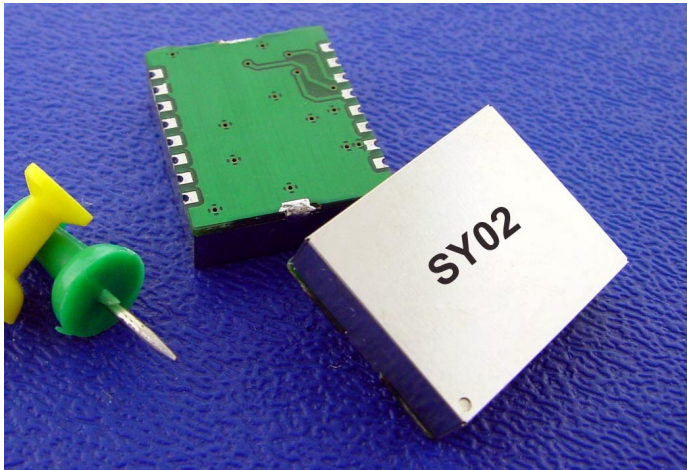


## SY02-MFTC

Date: January 7,2004



### • INTRODUCTION

The SY02-MFTC is a high frequency crystal-based PLL synchronizer designed as a module level subsystem for easy incorporation into telecommunication equipment SONET/SDH/ATM/DWDM. Supports multiplexing of up to 4 independent references translated into one single jitter free frequency source.

### • FEATURES

- Low jitter output from intrinsically low jitter VCXO ;
- User Selected one LVCMOS/HCMOS Input frequency **Up to 77.76MHz**
- One frequency LVCMOS/HCMOS output with enable/disable function **Up to 77.76MHz** (pre-select frequency value – upon order)
- Alarms status and VCXO monitor;
- The unit changes timing modes in response to external events;
- J-TAG service port for re-programming and servicing;
- 3.3V DC power supply
- Small dimensions: 0.8" x 1.00"

### • APPLICATIONS

- ATM
- SDH
- PDH
- SONET
- DWDM
- FEC
- Other telecommunication equipment.

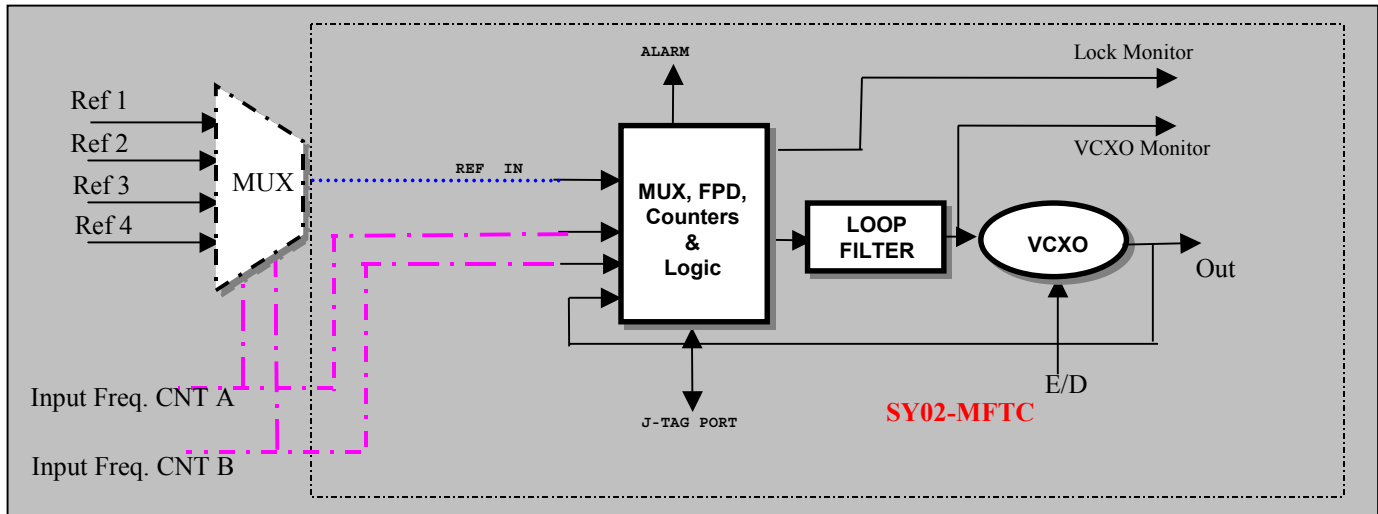


Figure 1 – Block Diagram (\*\*Components outside the dotted line are user supplied)

## • DESCRIPTION

The SY02-MFTC is a High Frequency Phase Lock Loop has been designed as a module level subsystem for easy incorporation into telecommunication equipment. The module generates the high frequency (up to 200MHz) output from a low jitter VCXO (Crystal Based Oscillator). The output can be disabled externally by setting OUTEN pin high. The SY02-MFTC can be locked to a user defined input reference signal **(from 8KHz to 77.76MHz...for options please see table )**.

Frequency selection could be simultaneously achieved of up to 4 independent sources while combining the module with an external MUX. Raltron's SY02-MFTC device could be used as a frequency translator in PLL circuits or frequency regenerator device in cases where jitter cleaning and filtering is required. The module has a fast locking time and tolerates reference inputs with different duty cycles. The loop bandwidth is optimized in accordance with the VCXO used and

required output performance. The ALARM output signals monitor the status of the phase lock loop and indicates LOL (Loss of Lock Detect). If the reference REF IN is absent, the SY02-MFTC will automatically switch to free run mode and LOL will show "0" logic level. The SMD package dimensions are 0.80"x1.00" inch and powered by a supply of 3.3V.

### ➤ ALARM STATES

| LOLD | ALARM              |
|------|--------------------|
| 0    | Module in Free-run |
| 1    | Module locked      |

### ➤ Input Reference Control select

| CNT A | CNT B | Selected Option |
|-------|-------|-----------------|
| 0     | 0     | EXT Ref 1       |
| 0     | 1     | EXT Ref 2       |
| 1     | 0     | EXT Ref 3       |
| 1     | 1     | EXT Ref 4       |

• **PIN DESCRIPTION**

|    | Name           | Description                                                                                                          | Signal Technology     | VL    |       |      | VH/ DC Voltage |       |       |
|----|----------------|----------------------------------------------------------------------------------------------------------------------|-----------------------|-------|-------|------|----------------|-------|-------|
|    |                |                                                                                                                      |                       | Min   | Typ   | Max  | Min            | Typ   | Max   |
| 1  | Ref In         | Input Reference Signal                                                                                               | HCMOS (3.3 Tolerable) | 0     | ----- | 0.3  | 2.97           | ----  | ----  |
| 2  | GND            | Ground                                                                                                               | -----                 | ----- | ----- | ---- | -----          | ----- | ----- |
| 3  | LOL            | Lock Detect Alarm out – High when locked; Low when unlocked                                                          | DC                    | 0     | 0.15  | 0.3  | 2.97           | 3.3   | 3.465 |
| 4  | MNTR           | VCXO Monitor out- DC control voltage offset indicator (when locked shall be within); 0.3<Vmntr<3.0 (for 3.3V supply) | DC                    | 0     | 0.15  | 0.3  | 2.97           | 3.3   | 3.465 |
| 6  | N/C            | No Connect                                                                                                           | -----                 | ----- | ----- | ---- | -----          | ----- | ----- |
| 7  | GND            | Ground                                                                                                               | -----                 | ----- | ----- | ---- | -----          | ----- | ----- |
| 8  | Enable/Disable | Output Enable - > enables the output, active low or floating Disables the output, active high                        | DC                    | 0     | 0.15  | 0.3  | 2.97           | 3.3   | 3.465 |
| 9  | OUT            | Oscillator Output -> Output of the module                                                                            | HCMOS (3.3 Tolerable) | 0     | ----- | 0.3  | 2.97           | ----  | ----  |
| 10 | GND            | Ground                                                                                                               | -----                 | ----- | ----- | ---- | -----          | ----- | ----- |
| 11 | N/C            | No Connect                                                                                                           | -----                 | ----- | ----- | ---- | -----          | ----- | ----- |
| 12 | CNT A          | Frequency Select; See Table page 2.                                                                                  | DC                    | 0     | 0.15  | 0.3  | 2.97           | 3.3   | 3.465 |
| 13 | CNT A          | Frequency Select; See Table page 2.                                                                                  | DC                    | 0     | 0.15  | 0.3  | 2.97           | 3.3   | 3.465 |
| 14 | N/C            | No Connect                                                                                                           | -----                 | ----- | ----- | ---- | -----          | ----- | ----- |
| 15 | GND            | Ground                                                                                                               | -----                 | ----- | ----- | ---- | -----          | ----- | ----- |
| 16 | Vcc            | Positive supply voltage                                                                                              | DC – 3.3V             | ----- | ----- | ---- | 2.97           | 3.3   | 3.465 |

• **ORDERING INFORMATION**

- Input/Output Frequencies available;

| Frequency  | Suffix | Frequency  | Suffix |
|------------|--------|------------|--------|
| 8KHz       | F8     | 20.4800MHz | A4     |
| 1.024MHz   | E0     | 22.2171MHz | A5     |
| 1.544MHz   | T1     | 26.0000MHz | G3     |
| 2.048MHz   | E1     | 27.0000MHz | A6     |
| 4.096MHz   | E2     | 29.4912MHz | A7     |
| 6.1760MHz  | T2     | 32.768MHz  | E5     |
| 6.480MHz   | D1     | 34.560MHz  | A8     |
| 8.192MHz   | E3     | 37.0560MHz | A9     |
| 10.000MHz  | A1     | 38.880MHz  | O2     |
| 12.800MHz  | S1     | 44.4343MHz | B1     |
| 13.000MHz  | G1     | 44.7360MHz | T3     |
| 15.000MHz  | A2     | 51.8400MHz | D2     |
| 16.384MHz  | E4     | 61.4400MHz | U1     |
| 19.440MHz  | O1     | 62.5000MHz | G5     |
| 20.000MHz  | M1     | 65.5360MHz | B2     |
| 20.1416MHz | A3     | 77.7600MHz | O3     |
| 37.0560MHz | A9     |            |        |

## ➤ P/N System

SY02-MFTC – IP < Input Frequency> - OU<Output Frequency>-S-T<Temp. Range>

➤ See above Chart  
(If not listed Place **NL** and state the Freq.)

➤ See above Chart  
(If Output Freq. Not applied place **NA** and state the Freq.)

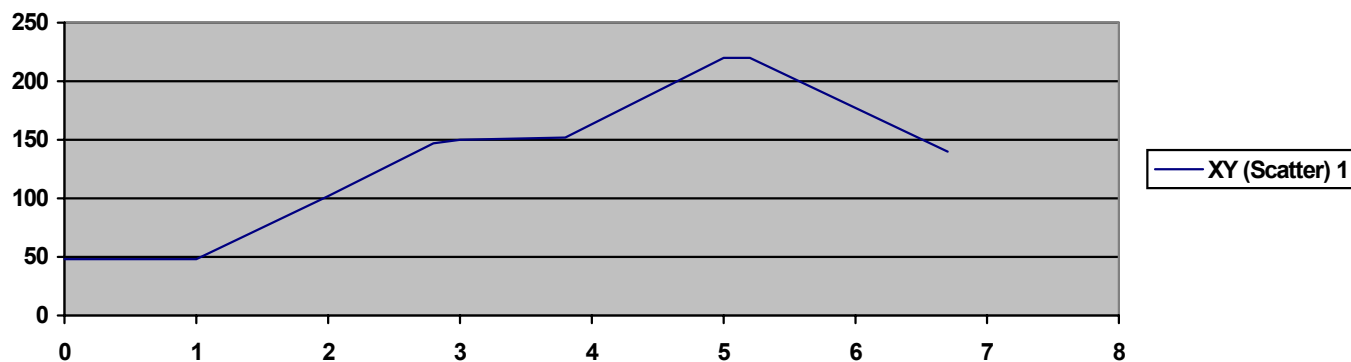
➤ Supply Voltage;  
**4** – 3.3V

➤ Operating Temperature Range;  
**C** – 0°C to 70°C  
**I** – -40°C to +85°C

## • SPECIFICATION

|                            |                                           |                                                                                                   |                                                                                                    |
|----------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| General Specifications     | Mechanical                                | <b>1.000" x 0.800"x0.235"</b>                                                                     | <b>SMT Module FR4 16 pins dual-in-line</b>                                                         |
|                            | Power Environment                         | 3.3VDC +/-5%, <200mA<br>Operating Temperature<br>Humidity<br>Internal Oscillators<br>VCXO or VCXO | Regulated<br>0°C to 70°C or -40°C to +85°C<br>5% to 95% non-condensing<br>Depends on the frequency |
| Input Signals              | Number of Reference Inputs                | 1                                                                                                 | Up to 4 selectettable with an external MUX                                                         |
|                            | Input reference frequency<br>Signal Level | Per selected table on page 3<br>HCMOS (3.3 V tolerable)                                           | (other input frequencies available)                                                                |
| Output Signals             | Number of Outputs                         | 1                                                                                                 |                                                                                                    |
|                            | Output 1                                  | Per selected table on page 3                                                                      | other frequency contact Raltron                                                                    |
|                            | Output 1 Signal Level                     | HCMOS/LVCMOS                                                                                      |                                                                                                    |
|                            | Duty Cycle                                | 50+/-10%                                                                                          | 50%+/-5% available upon request                                                                    |
|                            | Tracking/Capture Range                    | ±50ppm APR min                                                                                    |                                                                                                    |
| Signal Quality Performance | Jitter generation                         | <0.001UI RMS<br><0.001UI RMS<br><0.0001 UI RMS<br><0.0001 UI RMS                                  | HPF 30Hz<br>HPF 500Hz<br>HPF 12KHz<br>HPF 100KHz                                                   |
|                            | Jitter attenuation                        | -40dB<br>-10dB                                                                                    | Fj=10Hz~1KHz<br>Fj=1KHz~10MHz                                                                      |
|                            | Jitter tolerance                          | 2 μs, 10 Hz (0.05 UI @ 8KHz)                                                                      |                                                                                                    |

- REFLOW PROFILE



- OUTLINE DRAWING

