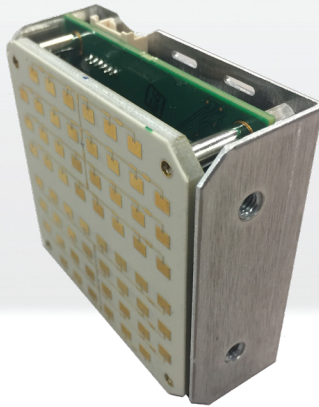


# SI-3C™

System Interface 3  
Compact Low Profile



## User's Manual

Rev: 5-14-19

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## Welcome To Decatur Electronics, Inc.!

Thank you for choosing this Decatur Electronics product—the System Interface 3 Compact (SI-3C)™, a highly advanced, low profile directional radar unit that will reward your department with years of dependable service. The SI-3C™ incorporates high performance and long range with many leading features. We urge you to study this manual before using the SI-3C™ so you can maximize the benefits of this sophisticated radar device. We believe you will be pleasantly surprised by the features and advantages.

If you are as pleased with its performance as we think you will be, ask your Decatur sales representative about other Decatur products including the Genesis™ line of radars, the Onsite™ line of speed trailers, dollies, pole signs and the Responder™ line of in-car video systems.

Try any one of our products and see if you don't agree that it is the best-in-class!

—The Management and Staff at Decatur Electronics

## About This Manual

This manual contains valuable information to help you set up, use and maintain your radar so you can optimize its life and keep it at peak performance. Please take a moment to read through it, and keep it handy for future reference.

### Note the following symbols in this manual:



Indicates a warning message about safety precautions. Please read it carefully.



Indicates a helpful tip or precaution to note.

## 1. Safety Information

All service needs should be referred back to the manufacturer.



### WARNINGS

- Do not over voltage the radar - it can damage the unit!
- The SI-3C™ is designed to operate off of conventional +12 VDC (+9 VDC to +24 VDC) from the serial cable.

## Important Warnings



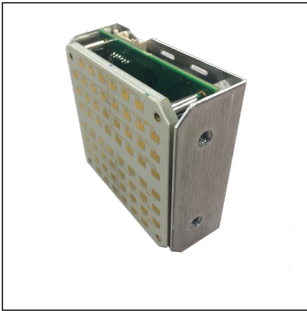
- Disassembly of the SI-3C™ automatically voids any warranty still in effect. There are no user serviceable parts inside.
- Do not expose the SI-3C™ to excessive moisture. Never submerge the device.
- Do not drop the SI-3C™ on hard surfaces since damage could occur. Units damaged by dropping or abuse are not covered for warranty repair.

Violation of these guidelines may void the warranty.

## 2. Receiving Inspection

When you receive your SI-3C™:

- Inspect it for any freight damage that might have happened during shipping or unloading. Take pictures to document any damage.
- Notify the freight company immediately of any damage, preferably while the driver is present.
- Record the damage on the bill of lading and keep a record of the problems or damage.
- The package should include the following pictured items along with this User's Manual.



SI-3C™



Programming Software



S900-34  
Tuning Fork



S769-78613-0  
Serial cable

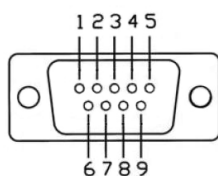
### 3. Getting Started

#### 3.1 Introduction

The SI-3C™ is a low profile radar specifically designed to measure speeds and export that speed information as RS232 data via the special serial cable. This allows the SI-3C™ to be used for a wide range of applications such as Radar Speed Trailers, traffic speed data collection (when used with the Decatur EZ Stat™ data logger) or other uses where speed monitoring is desired. The SI-3C™ comes with a Programming disk that allows the user to configure certain parameters of the SI-3C™ for specific applications. Refer to Chapter 4 for configuration information. Additionally, a Radar Monitor program is also available that allows you to display speed information on your computer and record that information to a text file for analysis.

#### 3.2 Connecting the Serial Cable

The SI-3C™ operates off of +12VDC and comes with a cable that has two connectors. The circular connector plugs into the SI-3C™ and the DB-9 serial connector (shown in Figure 3.2) is used for powering and communicating with the SI-3C. When connecting the cable it is important to understand that unlike standard RS232 serial connectors that have no +12VDC provisions, the SI-3C's™ serial connector has two pins dedicated to B+ and ground for the purpose of powering the unit. Figure 3.2 shows the pin arrangement.



**Figure 3.2**

Front view SI-3™ Serial Connector

#### Top Row

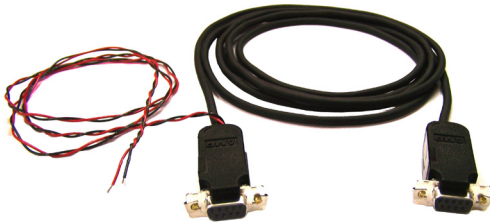
- Pin 1 = +12VDC (power)
- Pin 2 = RS232 TX
- Pin 3 = RS232 RX
- Pin 4 = N/C
- Pin 5 = RS232 Ground

#### Bottom Row

- Pin 6 = N/C
- Pin 7 = N/C
- Pin 8 = Remote On
- Pin 9 = Ground (power)

### 3.3 Optional Programming Cable

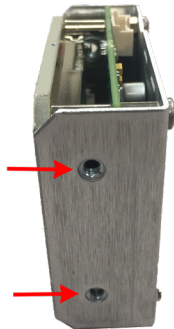
For configuring and testing purposes a programming cable is available. The cable is designed with two DB-9 connectors and a black and red wire for supplying B+ and ground to the SI-3C™. One end of the cable plugs into the serial port of a computer and the other end into the SI-3C™. The same end that plugs into the SI-3C™ has a red wire that is connected to +12 VDC and a black wire that is connected to ground. A regulated power supply can be used to supply the +12 VDC. Once the programming software is installed on the computer then the SI-3C™ can be accessed and parameters changed to meet your application. Refer to Chapter 4 for programming information.



**Figure 3.3**  
S769-127-0  
Optional Programming Cable

### 3.4 Mounting Configuration

The SI-3C™ comes equipped with mounting holes. There are two holes on each side of the mounting plate (See Figure 3.4). Use these holes only to mount the SI-3C™.



**Figure 3.4**  
Mounting hole locations



## 4. Configuring the SI-3C™

Before proceeding make sure your computer has Microsoft® Net Framework Version 4.0™ installed. If not, you can install it by going to: <http://msdn.microsoft.com/en-us/netframework/aa569263.aspx>.

### 4.1 Equipment Needed

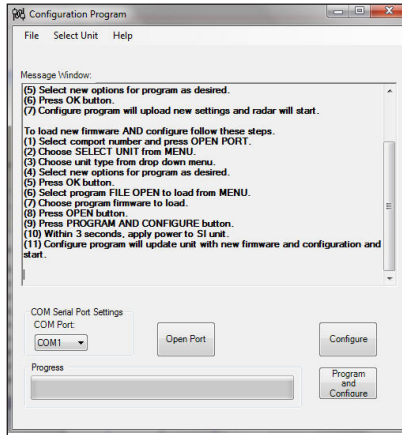
- SI-3C™ radar device
- SI-3C™ Programming cable (S769-127-0)
- PC with either a usable RS232 serial port or a USB-to-RS232 adapter.
- RS232 cable to connect between the Power and Communications adapter and the PC (if needed). This cable is a 9-pin RS232 cable with a male connector on one end and female connector on the other.
- SI-3C™ configuration flash drive(S785-1-0)
- 12V power supply

### 4.2 Setup

1. Connect the SI-3C™ to the programming cable using the end of the cable that has the red and black wire coming out of it.
2. Connect the red wire to the positive (+12 VDC) of the power supply and connect the black wire to the negative (ground) side of the power supply. Do not turn the power supply on.
3. Connect the other end of the programming cable to the serial port of your computer. If you do not have a serial port and are using a USB to Serial adapter make sure you have installed the USB to serial adapter software (driver) first. Then connect the adapter to the programming cable. Plug the USB to serial adapter into your computer's USB port.

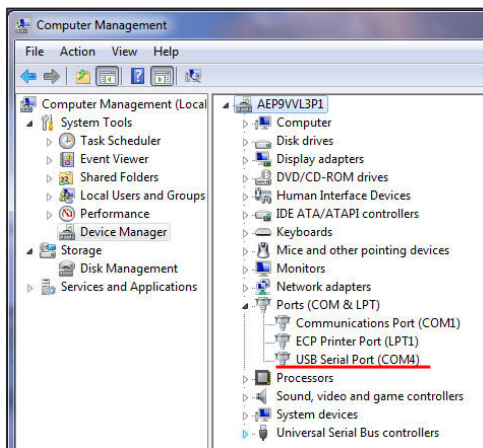
### 4.3 Configuration Program Screen

1. Open and run the Configure4 (configuration) program; which is shown in Figure 4.3a.



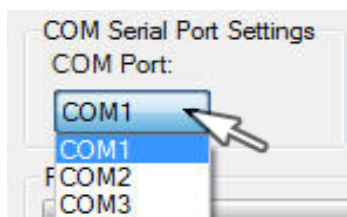
**Figure 4.3a**  
Configuration Program screen

- The SI-3C™ Configuration Program is designed to automatically recognize the assigned USB port. However, if for some reason it does not recognize the port you can find what port has been assigned by checking "Device Manager/ Ports" on your computer. The port assignment will appear as "USB Serial Port". Note the port assignment. The example in Figure 4.3b shows that Port 4 has been assigned. Your port assignment may be different and the port assignment can change the next time the USB to Serial adapter is plugged in to the computer.



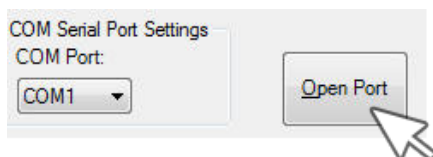
**Figure 4.3b**  
Device Manager screen

- From the Configuration Program/Com Serial Port Settings screen (Figure 4.3c) click on the down arrow and select the COM port that your PC has assigned. If you are connecting through the computer's serial port, it will normally be "Com 1" or "Com 2". If you are using the USB to Serial adapter, use the port shown in Device Manager/Ports. Once the correct port is known, the Device Manager/Computer Management screens can be closed.



**Figure 4.3c**  
Comm port selection

- Once the COM port has been selected, left click on the "Open Port" button. A "COM port OPEN" message will be displayed indicating that the COM port is now active. (See Figure 4.3d)



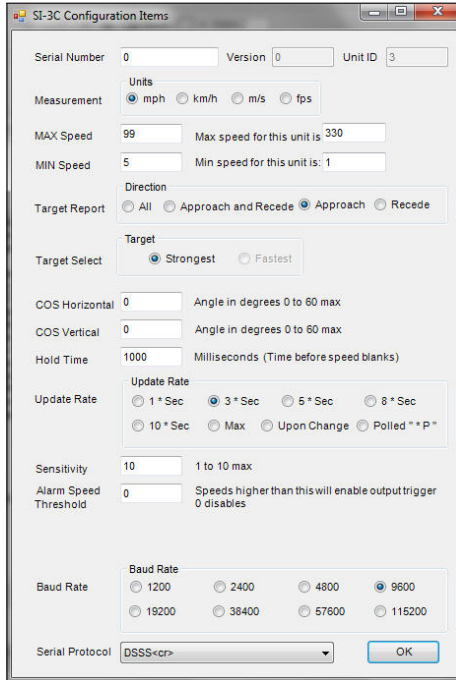
**Figure 4.3d**  
Press the Open Port button

- Press the CONFIGURE button. (Figure 4.3e)



**Figure 4.3e**  
Press the CONFIGURE button

6. Within 3 seconds of pressing the CONFIGURE button, apply power to the SI-3C™ unit.
7. The Configure program will bring up the "SI-3C Configuration Items" dialog box. (Figure 4.3f)



**Figure 4.3f**  
Configuration Items screen

8. Select new options for programming as desired. An explanation of the settings is described in Section 4.4.
9. Once new options have been selected, press the OK button. The Configure program will upload the new settings and the SI-3C™ will start.

## 4.4 Configuration Items Screen

The "SI-3C Configuration Items" screen allows for the setting of several different parameters so that you can tailor the SI-3C™ to your application. An explanation of each setting starting at the top of the configuration screen follows:

### 4.4.1 Serial Number

Pre-Set at the factory.

### 4.4.2 Version & Unit ID

Pre-set at the factory.

### 4.4.3 Measurement

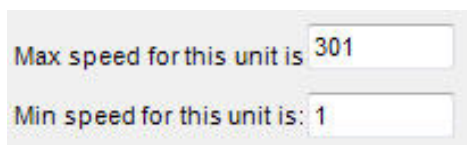
Select the speed format that the SI-3C™ is to use.

- Miles-per-hour - Select "*mph*"
- Kilometers-per-hour - Select "*km/h*"
- Meters-per-second - Select "*m/s*"
- Feet-per-second - Select "*fps*"

The maximum and minimum speed range for each of the speed formats will be displayed in the "*Max speed for this unit is:*" and the "*Min speed for this unit is:*" windows. The speed ranges for the various selections are:

- For "*mph*" the speed range is 1-330 mph (pre-set at 5-99)
- For "*km/h*" the speed range is 2-480 km/h (pre-set at 5-99)
- For "*m/s*" the speed range is 1-133 m/s (pre-set at 5-99)
- For "*fps*" the speed range is 1-440 fps (pre-set at 5-99)

As an example, Figure 4.4.3a shows the speed range when the "*mph*" speed format is selected.



The image shows a screenshot of a configuration screen with two input fields. The top field is labeled "Max speed for this unit is:" and contains the value "301". The bottom field is labeled "Min speed for this unit is:" and contains the value "1".

**Figure 4.4.3a**  
Speed range for mph

The speed range can be adjusted within those ranges by changing the speed readings that appear in the "MAX Speed" and "MIN Speed" windows (See Figure 4.4.3b). No vehicles will be reported outside the minimum and maximum configured speeds



MAX Speed	99
MIN Speed	5

**Figure 4.4.3b**

Set the speed range you want to use

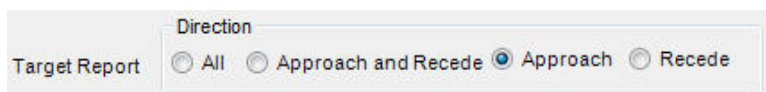
As an example, when "mph" is selected the minimum and maximum speeds that can be processed are 1 to 301 mph respectively. However, if the SI-3C™ is going to be used in an application where any speed above 90 mph is to be ignored, then the "MAX Speed" window can be changed to 90 and no speed above 90 will then be processed. Likewise, if the SI-3C™ is to be used where no speeds below 30 mph need to be considered then setting the "MIN Speed" to 30 will cause the SI-3C™ to not report any speeds below 30 mph.

#### **4.4.4 Target Report**

The "Target Report" has four selections and allows you to set the direction reporting of the SI-3C™. It is recommended that the user start with the "All" selection when first setting up the SI-3C™.

- All** - Tracks the strongest overall target signal regardless of direction.
- **Approach and Recede** - Tracks the strongest true directional target coming towards or going away from the SI-3C™. This mode contains directional filtering that will filter out any signal that doesn't have a good directional signal.
- **Approach** - Tracks the strongest true directional target coming towards the SI-3C™. This mode contains directional filtering that will filter out any signal that does not have a good directional signal.

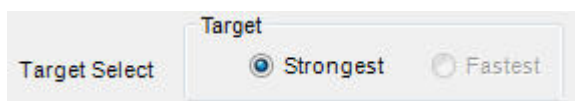
- **Recede** - Tracks the strongest true directional target going away from the SI-3C™. This mode contains directional filtering that will filter out any signal that does not have a good directional signal.



**Figure 4.4.4**  
Target Report

#### 4.3.5 Target Select

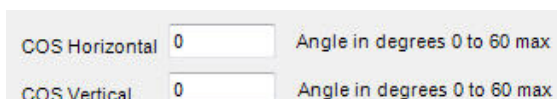
Currently not selectable. A Target Select value of "Strong" is the standard SI-3C™ configuration.



**Figure 4.4.5**  
Target Select

#### 4.4.6 Cosine Horizontal and Cosine Vertical

For bridge-type installations where the SI-3C™ is over the traffic and pointing slightly down, the vertical angle can be entered here to ensure that the SI-3C™ calculates the correct vehicle speeds. For installations where the SI-3C™ is at a significant angle from the road, the horizontal angle can also be configured. These two may be used together. **Keep the angles between 0 and 45 degrees for maximum accuracy.** Default is "0".



**Figure 4.4.6**  
Cosine settings

#### 4.4.7 Hold Time

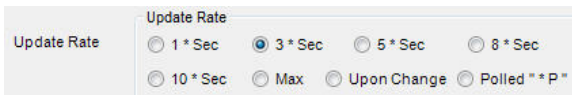
The "Hold Time" value indicates the length of time in milliseconds the vehicle speed is displayed after the vehicle moves out of range. The default "Hold Time" is 1000 milliseconds.



**Figure 4.4.7**  
Hold Time

#### 4.4.8 Update Rate

The selected speed format will be sent in whatever time interval (in seconds) that you set. The "Update Rate" can be as low as 1 second, or as high as 10 seconds. The "Update Rate" and the amount of serial port activity do not affect the measurement accuracy of the SI-3C™. The default rate is 1 Second.



**Figure 4.4.8**  
Update Rate

#### 4.4.9 Sensitivity

The SI-3C™ has a sensitivity range of 1-10 and is shipped with the range setting at the (10) maximum (See Figure 4.4.9). The sensitivity can be decreased for closer range if needed. When changing the "Sensitivity" remember that if the setting is too low the SI-3C™ may take too long to lock onto and display a speed and if too high it may lock onto distant targets that are undesired.

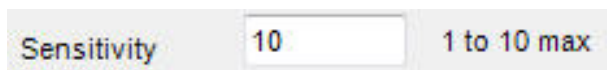


Typical ranges for an on-coming mid-sized sedan are:

Setting	Range (feet)
1	350
2	575
3	800
4	950
5	1300
6	1700
7	1875
8	2400
9	2800
10	>3000

**Figure 4.4.9**

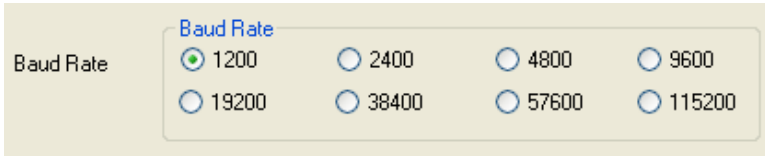
The distances will vary based on location, body of the car and alignment of the antenna. It is normal for the range to vary by 10% on identical cars.



**Figure 4.4.9**  
Sensitivity Setting

#### 4.4.10 Baud Rate

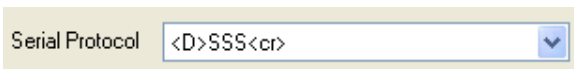
The "Baud Rate" can be 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200 bits per second. The SI-3C™ always uses 8 bits, no parity, and one stop bit for its serial port configuration. The default baud rate is 1200.



**Figure 4.4.10**  
Baud Rate

#### 4.4.11 Serial Protocol

Currently there is only one protocol available. <D> is a direction character that is "+" for vehicles coming towards the sign, "-" for vehicles moving away, and "?" when the direction cannot be determined. [S] represents the displayed speed. If a period is within the square brackets it is the decimal point. Any zeros are sent as described and do not change with a vehicle's speed. The <cr> signifies the end of the outgoing message.



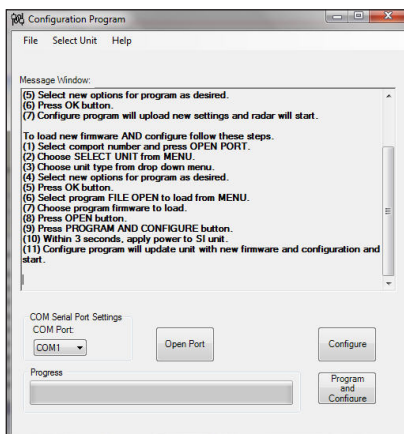
**Figure 4.4.11**  
Serial Protocol

Once new options have been selected, press the OK button. The Configure program will save the new settings into memory and the SI-3C™ will start each time with these new settings until you change them again.

### 4.5 Loading New Firmware & Configuring the SI-3C™

From time to time Decatur Electronics will release new firmware for the SI-3C™. If you have received new firmware then save the firmware to a file on your hard drive remembering the path to where the file is saved. Connect the SI-3C™ to your computer as described in Section 4.2.

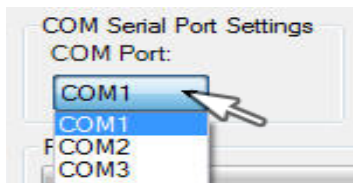
1. Open and run the Config 4 (configuration) program; which is shown in Figure 4.5a.



**Figure 4.5a**

Configuration Program screen

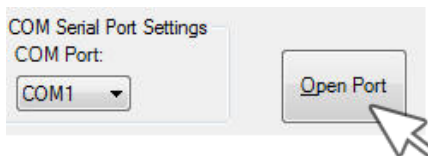
2. The SI-3C™ Configuration Program is designed automatically recognize the USB port. However, if it does not you can select the port yourself. For instructions on determining the correct port assignment refer to Section 4.3, point 2.



**Figure 4.5b**

Communications Port Selection

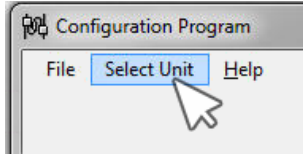
3. Once the correct port has been selected, Press "OPEN PORT".



**Figure 4.5c**

Press the Open Port button

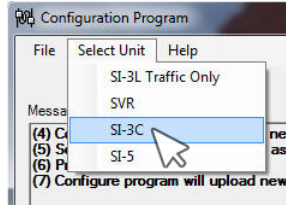
- Choose SELECT UNIT from Menu.



**Figure 4.5d**

Press the Select Unit button

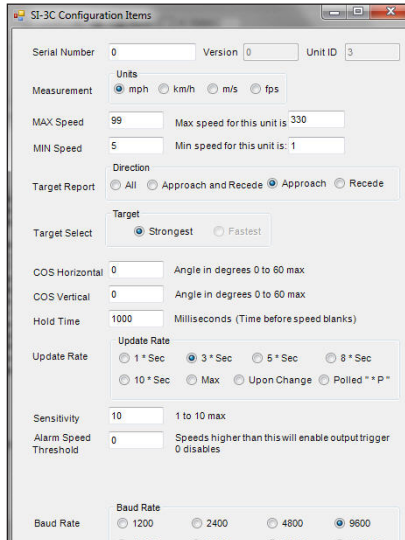
- Choose "SI-3C" from drop down menu.



**Figure 4.5e**

Press the Select Unit button

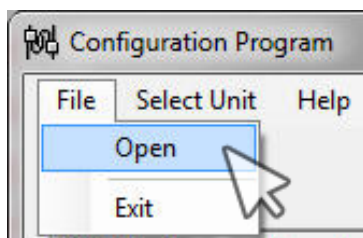
- The SI-3C Configure Items screen will appear. Select new options as desired. Refer to Section 4.3, point 6 for additional information on configuring items. Once changes have been made, or if no changes are needed, press the "OK" button.



**Figure 4.5f**

Configuration Items screen

- Click on the "File" tab and then click on the "Open" button.



**Figure 4.5g**  
Press the Open button

- The "Please select a file" screen will appear. From the screen select the firmware file from where you have saved it on your hard drive.
- Press the "OPEN" button.
- Press the "Program and Configure" button if you want the SI-3C™ to accept the changes that have been made to the "SI-3C Configuration Items" screen *and* to program the SI-3C™ with new firmware.



**Figure 4.5h**  
Program and Configure button

- Within 3 seconds of pressing the CONFIGURE button, apply power to the SI-3C™ unit.
- The Configure program will update the SI-3C with new firmware and any configuration changes made and start.

#### **4.6 Configuration Notes**

All changes occur immediately and do not require a reboot of the SI-3C™ to become operational.

#### 4.7 SI-3C™ Command Set

Commands transmitted to the SI-3C unit will be variable length messages in ASCII followed by a carriage return <CR> or <decimal 13>. Messages received by the unit will be followed by an acknowledgment ASCII "OK". To save new settings into permanent flash memory, an ASCII "F" followed by a <CR> must be sent to the unit (otherwise, new settings will get lost on power-down

##### **Get unit ID**

Send ASCII i <CR>

Radar responds back with ASCII unit ID (0 – 255) <LF> <CR>

##### **Get serial number**

Send ASCII s <CR>

Radar responds back with ASCII unit serial number (0 – 65535)  
<LF> <CR>

##### **Set speed units/conversion**

Send ASCII C units <CR>

Where units =

0 -> mph,

1 -> kph,

2 -> fps,

3 -> m/s

Radar responds back with ASCII "OK" <LF> <CR>

##### **Set Max speed**

Send ASCII M XXX <CR>

Where XXX = max speed in ASCII format

Radar responds back with ASCII "OK" <LF> <CR>

##### **Set min speed**

Send ASCII m XXX <CR>

Where XXX = min speed in ASCII format

Radar responds back with ASCII "OK" <LF> <CR>

**Set target report**

Send ASCII TX <CR>

Where ASCII value

X = 0 -> All targets,

X = 1 -> All directional,

X = 2 -> Towards,

X = 3 -> Away

Radar responds back with ASCII "OK" <LF> <CR>

**Set horizontal Cosine Angle**

Send ASCII H XX <CR>

Where XX = angle degrees in ASCII format

Radar responds back with ASCII "OK" <LF> <CR>

**Set vertical Cosine Angle**

Send ASCII V XX <CR>

Where XX = angle degrees in ASCII format

Radar responds back with ASCII "OK" <LF> <CR>

**Set hold time**

Send ASCII h XXXX <CR>

Where XXXX = milliseconds in ASCII format

Radar responds back with ASCII "OK" <LF> <CR>

**Set update rate**

(note: radar requires a power cycle for new values to be used)

Send ASCII U X <CR>

Where X = 0 -> 1\*sec, X = 1 -> 2\*sec, X = 2->5\*sec, X=3->8\*sec,X=4->change only, X=5->poll

Radar responds back with ASCII "OK" <LF> <CR>

**Set sensitivity**

Send ASCII S X <CR>

Where X = Sensitivity in ASCII format (0 to 9 allowed) 9 is maximum value.

Radar responds back with ASCII "OK" <LF> <CR>

**Set protocol**

Send ASCII P XX <CR>

Where XX = serial port protocol 00 to 99

XX = 00 -> none

XX = 01 -> standard output for that model

XX = 02 -> FFT output

XX = 03 -> debug

Radar responds back with ASCII "OK" <LF> <CR>

**Set baud rate**

Send ASCII B X <CR>

Where X = baud rate selector number in ASCII format

X = 0 -> Baud rate set to 1200

X = 1 -> Baud rate set to 2400

X = 2 -> Baud rate set to 4800

X = 3 -> Baud rate set to 9600

X = 4 -> Baud rate set to 19200

X = 5 -> Baud rate set to 34800

X = 6 -> Baud rate set to 57600

X = 7 -> Baud rate set to 115200

Radar responds back with ASCII "OK" <LF> <CR>

Note: Settings will not be used until next power-on cycle.

**Set hi/low speed**

(only applies to SVR versions – other radars may respond with "?" or ignore)

Send ASCII L X <CR>

Where X =

X = 0 -> Low speed range = (0.1 to 20 fps)

X = 1 -> High speed range = (0.2 to 70 fps)

Radar responds back with ASCII "OK" <LF> <CR>



**Set Average time**

(only applies to SVR type radars – the time measurement speeds are averaged)

Send ASCII a XXX <CR>

Where XXX value =

000 -> instantaneous speed

001 -> 100 secs of averaging,

NOTE: Radar measurement time is 0.0625 secs (16 times per second)  
Radar responds back with ASCII "OK" <LF> <CR>

**Poll speed**

(only available if Radar is configured for polled mode)

Send ASCII \*P<CR> or \*<CR>

Radar responds with speed update

**Reset to factory defaults**

Send ASCII X <CR> or ASCII x <CR>

Radar will reset all configure items back to factory defaults and save to flash.

Radar responds back with ASCII "FACTORY DEFAULTS" <LF> <CR> if successful.

**Save configure items to FLASH**

Send ASCII F <CR>

Radar responds back with ASCII "OK FLASH SAVED" <LF> <CR> on success or ASCII "FLASH FAILURE" <LF> <CR> on failure.



- *Please wait 2 seconds after the last configuration command before disconnecting the power to allow the SI-3C™ to record the setting in flash memory.*

**Get configure data <not implemented – future release>**

Send ASCII c <CR>

Radar responds back with list of configurable items and values.

## 5. Performance Tips

Understanding potential radar interference and what to do when it occurs can greatly increase the radar's performance.

### 5.1 How Radar Works

Determining an object's speed begins with the radar transmitting a beam of microwave energy (radio waves) at an approaching or departing target. When energy from this beam strikes a target, a small amount of the beam is reflected back to the antenna. The reflected signal frequency shifts by an amount proportional to the speed of the target. This is known as the Doppler effect. The radar device then determines the target speed from the difference in frequency between the reflected and transmitted signal.

### 5.2 Interference Sources

When properly installed and operated, Doppler radar technology is extremely accurate and reliable. However, variations in the environment can cause situations and circumstances which can cause spurious (erratic and unusually low or high) speeds to display. Signs that a speed is spurious can include the following characteristics:

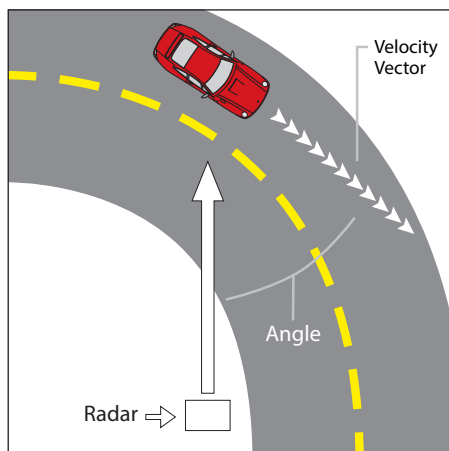
- A reading appears when no target is in the operational range of the antenna.
- A target entering the operational range overrides the interference signal, causing the display speed to change suddenly to the target's speed.
- Speeds are irregular.

#### 5.2.1 Angular Interference (Cosine Effect)

The cosine effect causes the system to display a speed which is lower than the actual target speed. This condition occurs when the target's path is not parallel to the antenna such as the target vehicle traveling on a curve or hill.

As the angle between the beam of the antenna and the target increases, the displayed speed decreases. Ideally, an angle of zero

(0) degrees is preferable, because the displayed speed is the actual target speed. However, in all uses of police radar, the radar device is always at a slight angle to the target vehicle to avoid collisions.



**Figure 5.2.1**

An angle between the antenna and the target causes the cosine effect

The following table shows the effect that an increasing angle has on a displayed speed.

Actual Speed	Horizontal Angle Degrees										
	0°	1°	3°	5°	10°	15°	20°	30°	45°	60°	90°
	Displayed speed:										
30 mph	30	29	29	29	29	28	28	26	21	15	0
40 mph	40	39	39	39	39	38	37	34	28	20	0
50 mph	50	49	49	49	49	48	46	43	35	25	0
60 mph	60	59	59	59	59	57	56	51	31	30	0
70 mph	70	69	69	69	68	67	65	60	49	35	0
80 mph	80	79	79	79	78	77	75	69	57	40	0

**Table 5.2.1**

Actual and displayed speeds at antenna-to-target angles

Small angles (less than 10°) have little effect on accuracy. As the angle increases, the displayed speed decreases. At 90°, the target speed is 0—grossly incorrect.

### **5.2.2 Fan Interference**

Fan interference is one of the most common forms of interference that you are likely to experience. It is caused when the radar measures the speed of a blower fan that is within the beam path of the radar. If the SI-3C™ is used inside of a building keep in mind that furnace and air conditioner fans can cause interference. To correct this, relocate the radar so it does not display spurious speeds or turn off the fan motor.

### **5.2.3 Electromagnetic Interference (EMI)**

Operating electric motors can produce EMI. EMI from power seats or windshield wipers can also produce spurious target speeds. To correct the interference, simply turn off its source.

### **5.2.4 Feedback Interference**

When the radar beam is directed at computer screens, streetlights, and other electronic devices it can display spurious speeds. Relocate the SI-3C™ to avoid the interference.

### **5.2.5 Multi-Path Beam Cancellation**

If multi-path beam cancellation occurs, the target vehicle speed sporadically blinks and reappears at semi-random intervals. This type of interference occurs when the radar loses track of a target because the target is reflecting two or more signals which are interfering with each other. The SI-3C™ is immune from multi-path cancellation.

### **5.2.6 Radio Frequency Interference (RFI)**

The system can inadvertently process radio energy as Doppler speeds including that from 2-way radios, airport radar, microwave transmission towers, CB radio transmitters, and AM/FM transmission towers. For this type of interference to occur, the SI-3C™ must be operating very close to the radio transmitter.

### **5.2.7 Scanning**

The SI-3C™ is designed to be used while attached to a solid mount position. Moving or “scanning” the antenna past stationary objects can cause the system to detect motion. Obtaining a speed reading from scanning will not happen as long as the antenna is held in one position and is not moved.

### **5.2.8 Environmental Factors: Rain & Snow**

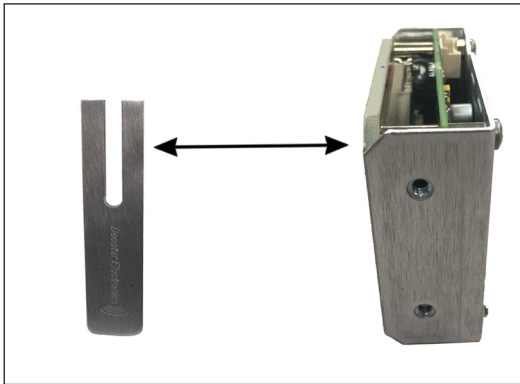
Environmental factors such as rain or snow can reduce the distance at which a target can be detected; however, these factors will not affect accuracy.

## 6. Testing the Device

### 6.1 Tuning Fork Test

If you have configured the SI-3C™ to display speeds in mph or km/h then you can verify signal processing accuracy by using a tuning fork. There is a one minute time window from when the SI-3C™ is first powered on in which you can test the unit using a tuning fork. After one minute the SI-3C™ switches to directional mode and the fork will no longer be read.

To begin the test, tap the tines of the fork on a firm, non-metallic surface. The tuning fork will ring audibly. Place the tuning fork that you tapped with the narrow side facing about 18 -24 inches directly in front of the antenna. Compare the speed in the display window to the speed stamped on the fork. If the difference is within  $\pm 1$  display unit, the SI-3C™ is working properly.



**Figure 6.1**

Place the vibrating tuning fork about 3 inches in front of the antenna

If the device does not display the expected speed, contact Decatur Electronics Customer Service at 888.428.4315 to arrange for service.

- Only tap the tuning fork against hard plastic, wood, and materials that are softer than metal. Repeatedly tapping the tines on hard surfaces, such as metal and concrete, can damage the tines and invalidate the fork for future tests.

## 7. Care, Cleaning, and Storage

- Avoid spilling food, beverages, and other liquids and substances on the radar device
- To clean use a soft clean cloth which is free of cleaning solutions

## 8. Specifications

(Specifications are subject to change without notice.)

### 8.1 Antenna Parameters

#### K-Band

FCC ID:	VECDF6
Transmission frequency	24.120 - 24.130 GHz
	24.125 nominal
Beamwidth	12° (Hor.) x 24° (Vert.)
Polarization	Linear
Output power (EIRP)	+20 dBm
Sidelobe Rejection	19 dB typical
Range (Distance)	3,000 feet
Physical Size	2.5" square, 1" deep
Weight	8 oz.

### 8.2 Environment

Ambient operating temperatures	-22°F to +158°F (-30°C to +70°C)
Maximum humidity	100% relative humidity (Unit is weather proof, not water proof)

### 8.3 Speed Range Parameters

Speed Display Ranges	Minimum	Maximum
mph option	1	330
km/h option	2	480
fps option	10	440
m/s	1	133

### 8.4 Power Consumption Parameters

Supply voltage range	+8VDC to +24VDC
Nominal Current Draw	90 mA at +12VDC

## 9. Legal Requirements

### 9.1 Documents

TCB	<p><b>GRANT OF EQUIPMENT AUTHORIZATION</b> Certification Issued Under the Authority of the Federal Communications Commission</p> <p>By:</p> <p>Siemic Inc. 775 Montague Expressway Milpitas, CA 95035</p>	TCB			
	Date of Grant: 10/13/2011				
	Application Dated: 10/13/2011				
<p><b>ST Electronics (Satcom &amp; Sensor Systems) Pte Ltd</b>  <b>1 Ang Mo Kio Electronics Park Road #06-02</b>  <b>ST Engineering Hub</b>  <b>Singapore, 667710</b>  <b>Singapore</b></p> <p><b>Attention: Alex Choo , Engineer</b></p>					
<p><b>NOT TRANSFERABLE</b></p>					
<p>EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.</p>					
<p>FCC IDENTIFIER: <b>VECDF6</b></p> <p><b>Name of Grantee:</b> ST Electronics (Satcom &amp; Sensor Systems) Pte Ltd</p> <p><b>Equipment Class:</b> Part 15 Field Disturbance Sensor</p> <p><b>Notes:</b> DF6 Transceiver</p> <p><b>Modular Type:</b> Single Modular</p>					
Grant Notes	FCC Rule Parts <b>15.245</b>	Frequency Range (MHZ) <b>24125.0 - 24125.0</b>	Output Watts	Frequency Tolerance	Emission Designator
<p>Modular approval. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.</p>					



## **9.2 FCC Statement**

This device complies with FCC part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

## **9.3 Conditions**

Changes or modifications to Decatur Electronics equipment not expressly approved by Decatur Electronics could void the user's authority to operate the equipment.

## **9.4 Installer Note**

This device must be installed in a manner that ensures 20 cm separation is maintained between this device's antenna and all persons in order to comply with the FCC and IC RF exposure requirements.

## **9.5 End User Note**

Maintain a 20 cm separation between this device's antenna and all persons during operation in order to comply with the FCC and IC RF exposure requirements.

## **9.6 Industry Canada**

This device complies with Industry Canada's RSS-310. Operation is subject to the condition that this device must not cause harmful interference and must accept any interference, including interference that may cause undesired operation of the device.

## 10. Frequently Asked Questions (FAQ)

**Q. *My SI-3C™ has poor range. How can I remedy this?***

- A. Verify that the antenna has no obstructions in front of it. If the unit still has poor range, increase the sensitivity level. If you still have this problem, contact Decatur Electronics.

**Q. *What if I drop my SI-3C™?***

- A. The unit is extremely durable. Simply power up and perform tuning fork test. If the unit doesn't appear to work properly, contact Decatur Electronics.

## 11. Warranty

### ONE-YEAR RADAR WARRANTY

Decatur Electronics, Inc. guarantees the SI-3C™ to be free from defects in workmanship and material and to operate within specifications for a period of one year. During this period, Decatur Electronics will repair or replace, at its option, any component found to be defective, without cost to the owner, providing you return the part to a Decatur authorized Service Provider.

The full warranty on parts and workmanship does not include normal wear and tear, crushing, dropping, fire, impact, immersion, misuse, vandalism, or damage from attempted repair or modifications by unauthorized service agents or improper voltage.

Refer to the instructions in the Service Return Procedure.

## 12. Service Return Procedure

If you have questions, want a quick problem diagnosis, or need to return your unit or a component from your unit:

- Call Decatur Electronics by phoning 800.428.4315 and ask to speak with a Customer Service Representative.
- Explain to the Customer Service Representative the problem you are experiencing.
- Based on the information that you provide, the Customer Service Representative may be able to assist you or you may need to be referred to one of our Service Providers.

On warranty items Decatur Electronics will pay the freight (up to \$10 U.S.) for shipping the system from the Service Provider to the customer. Please note that for any shipping charges above the initial \$10 (if you want the package shipped express or next day air) there will be an additional charge.

If you are referred to a Service Provider and your product is under warranty then once your product has been received, the Service Provider will investigate the problem. Once they have diagnosed the problem they will repair the product and return it to you.

If you are referred to a Service Provider and your unit is not under warranty then we recommend that you discuss the problem you are experiencing with the Service Provider and determine if an estimate is needed. Once your product has been received, the Service Provider will investigate the problem and you will be sent an estimate of cost, prior to any repair work being performed. After receiving the estimate, you can choose from the following options:

1. Approve the estimate and proceed with repair.
2. Decline the estimate, and pay an estimate fee and return shipping.
3. Discuss other options with the Service Provider.

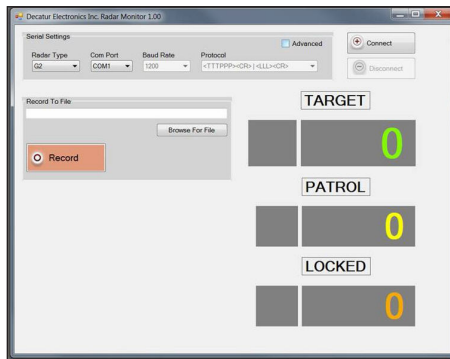
If your product is under warranty it will automatically be repaired and sent back to you.

### 13. How to Order Additional Products

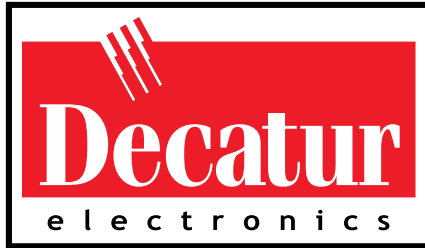
You can order upgrades and additional products for the SI-3C™ (when available). To see product descriptions or order products, see the Decatur Electronics Web site at [www.DecaturElectronics.com](http://www.DecaturElectronics.com) or call the sales office at 888.428.4315.

#### ***Radar Monitor***

The optional Radar Monitor program is designed to display speed information on a computer and record that information to a text file for analysis. The program has been design to work specifically with the SI-3C™. For more information on the Radar Monitor contact the sales offices at Decatur Electronics.



**Figure 13**  
Radar Monitor Screen



**[www.DecaturElectronics.com](http://www.DecaturElectronics.com)**  
800.428.4315