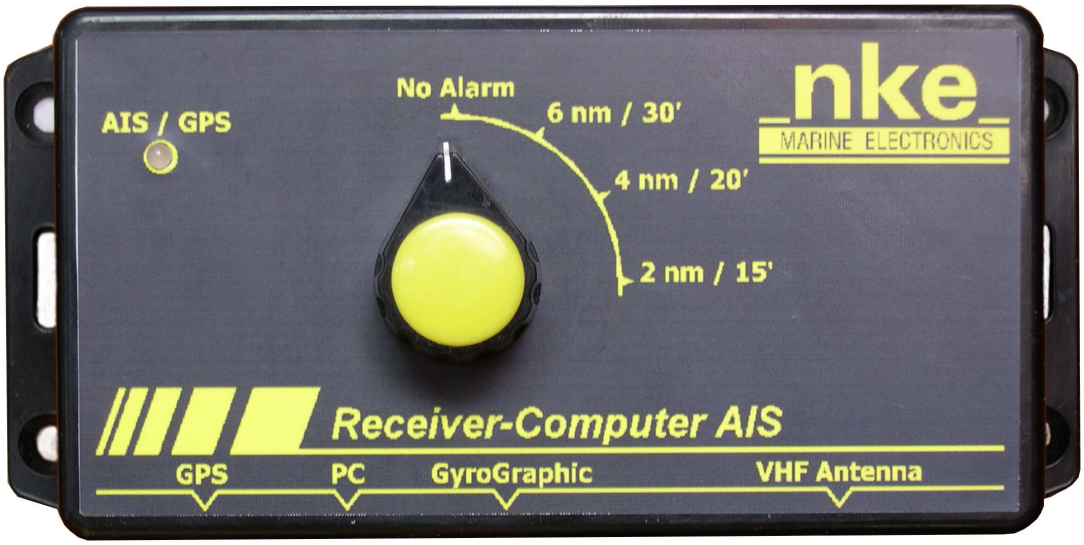
A.I.S RECEIVER-COMPUTER

Product part number: 90-60-495



USER MANUAL

nke MARINE ELECTRONICS

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1 OPERATION

1.1. INTRODUCTION

Thank you for purchasing the **nke** A.I.S. receiver-processor.

A.I.S. (**A**utomatic **I**dentification **S**ystem) is a worldwide system for exchanging information between ships and stations ashore. A.I.S uses dedicated VHF frequencies to automatically broadcast information such as ship's identification, status, position and route. This information is available to any ship or traffic control station within the signal reception area.

This data, combined with information coming from the GPS, allows the ***nke AIS Receiver-Processor*** to calculate collision risks and to send an alarm to the ***nke Gyrographic*** (version 3.20 and up) out in the cockpit.

DISCLAIMER

Data provided by the ***nke A.I.S. receiver-processor*** provides an indication only. The users acknowledge that they are aware that data received can be partial and / or incorrect and that they are solely responsible for any risks related to the use of this instrument. In no event shall ***nke*** be liable for any direct, indirect, incidental, or consequential damage related to the use of this instrument.

IMPORTANT

Please take time to read this manual carefully before you start installation

Any connection to the ***TOPLINE bus*** must be performed through the specific interface box # 90-60-417 and only with the ***TOPLINE bus*** cable # 20-61-001

System configuration

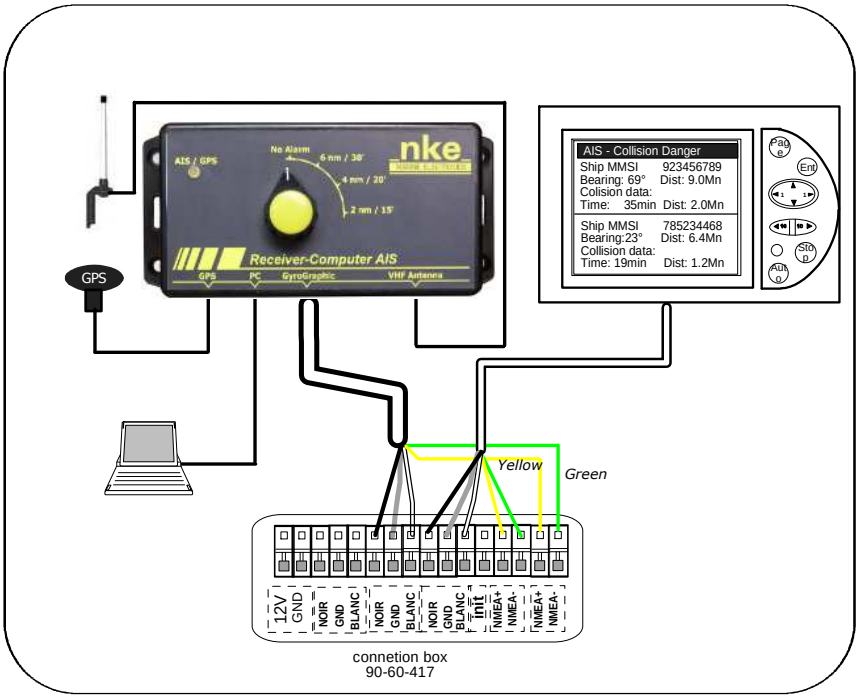


Figure 3 : Connection AIS Receiver to the Gyrographic

1.2. A.I.S. RECEIVER/PROCESSOR DESCRIPTION

The ***nke* A.I.S. Receiver/Processor** combines a highly sensitive receiver working on the 2 VHF frequencies dedicated to A.I.S. with an internal programmable processor to calculate the range and bearing of the alarm target, its ***CPA*** (Closest Point of Approach) and ***TCPA*** (Time Closest Point of Approach).

A rotating button allows the selection between 4 alarm ranges:

1. Off
2. Alarm if ***CPA*** < 6 nautical miles and ***TCPA*** < 30 minutes
3. Alarm if ***CPA*** < 4 nautical miles and ***TCPA*** < 20 minutes
4. Alarm if ***CPA*** < 2 nautical miles and ***TCPA*** < 15 minutes

The LED indicator will flash green when the unit receives a valid signal from the GPS, and red when receiving ***A.I.S.*** messages.

The GPS input uses a 2 wire connection. NMEA output sentence « RMC » must be selected on the GPS unit.

A VHF antenna for ***A.I.S***. reception is connected to the BNC socket.

A 2 wire connection (NMEA+ and NMEA-) outputs the signal to the RS232 port of a PC. All ***A.I.S*** data received by the ***Receiver/Processor*** can be used by a dedicated software.

A 5 wire cable connects the ***Receiver/Processor*** to the ***Topline*** system. The ***Gyrographic*** display will receive the alarm messages. The Topline bus also supplies power to the ***A.I.S Receiver/Processor* .**

1.3. OPERATION

1.3.1. Collision avoidance data processing

The ***A.I.S Receiver/Processor*** continually processes the signals received on the 2 A.I.S. frequencies. For each A.I.S. message received, it will check the safety zone and generate alarms according to the level activated:

Alarm if ***CPA*** < 6 nautical miles and ***TCPA*** < 30 minutes

Alarm if ***CPA*** < 4 nautical miles and ***TCPA*** < 20 minutes

Alarm if ***CPA*** < 2 nautical miles and ***TCPA*** < 15 minutes

CPA, ***TCPA,*** bearing and distance of the target are calculated and sent to the ***Gyrographic***.

Alarm principle

The ***CPA*** and ***TCPA*** values are chosen with the rotating button to define the safety range. The unit will generate an alarm if a target is detected and its ***CPA*** and ***TCPA*** are both below the level defined.

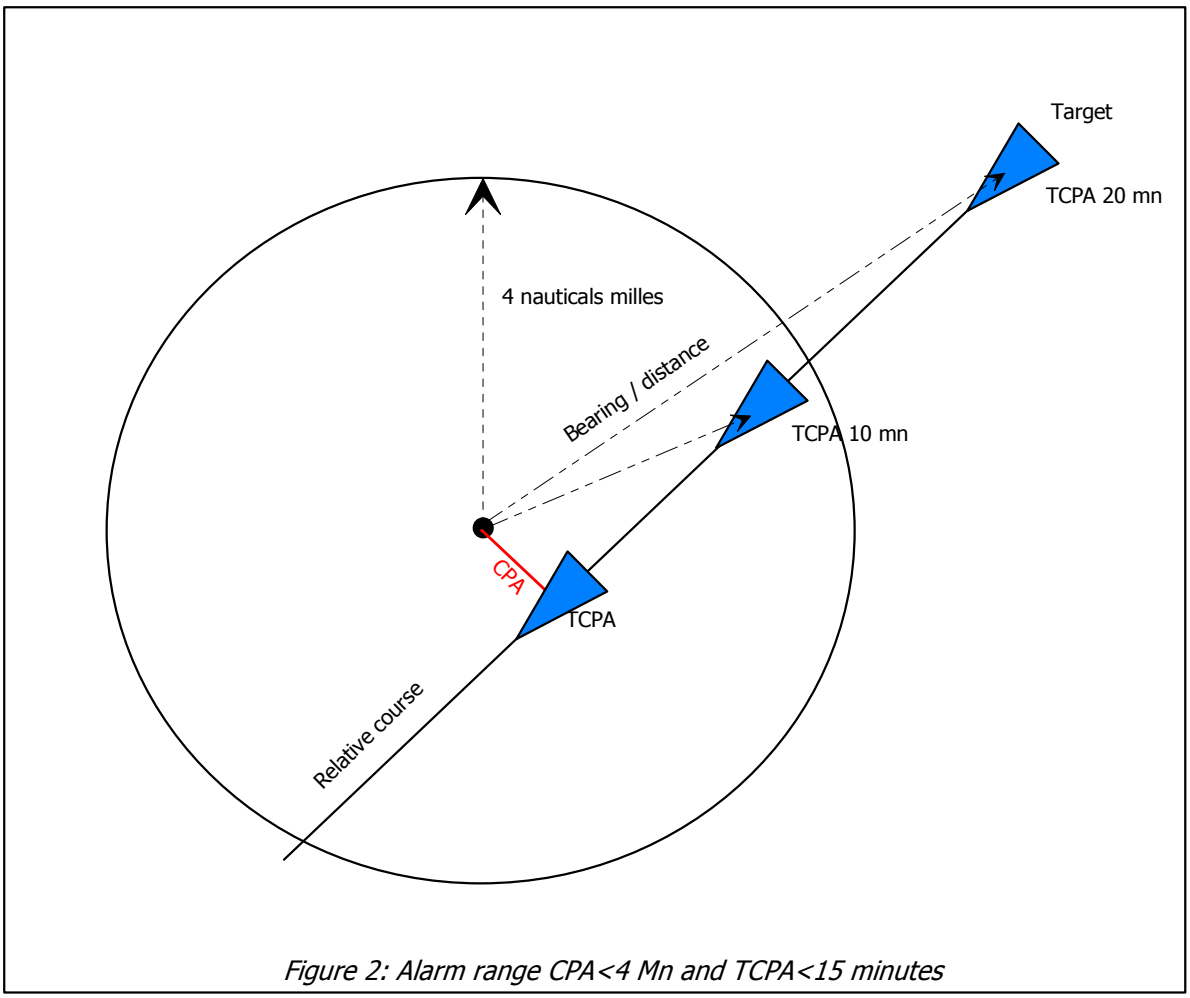
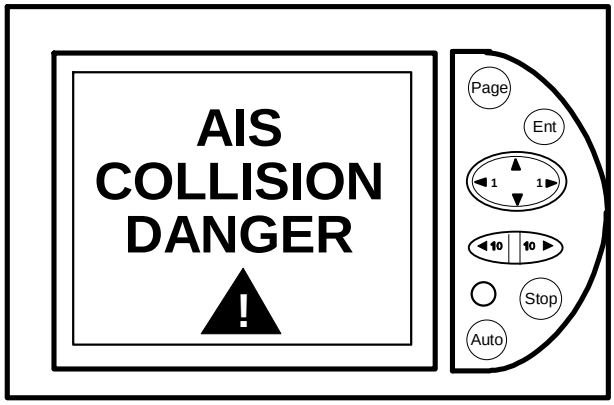


Figure 2: Alarm range CPA<4 Mn and TCPA<15 minutes

In the example (figure 2) the alarm level selected is **« CPA < 4 Nm and TCPA < 20 minutes ».** When the value of the ***CPA*** calculated is below 4 nautical miles **and** the ***TCPA*** calculated is less than 20 minutes, an alarm message will be sent to the ***Gyrographic***. For ***CPA*** below 4 nautical miles with a ***TCPA*** greater than 20 minutes, no alarm will be sent.

1.3.2. How is collision avoidance data displayed on the Gyrographic ?

When receiving the first collision avoidance message from the ***A.I.S Receiver/Processor*** the system sounds an alarm and displays a Collision Alert page on the ***Gyrographic.***

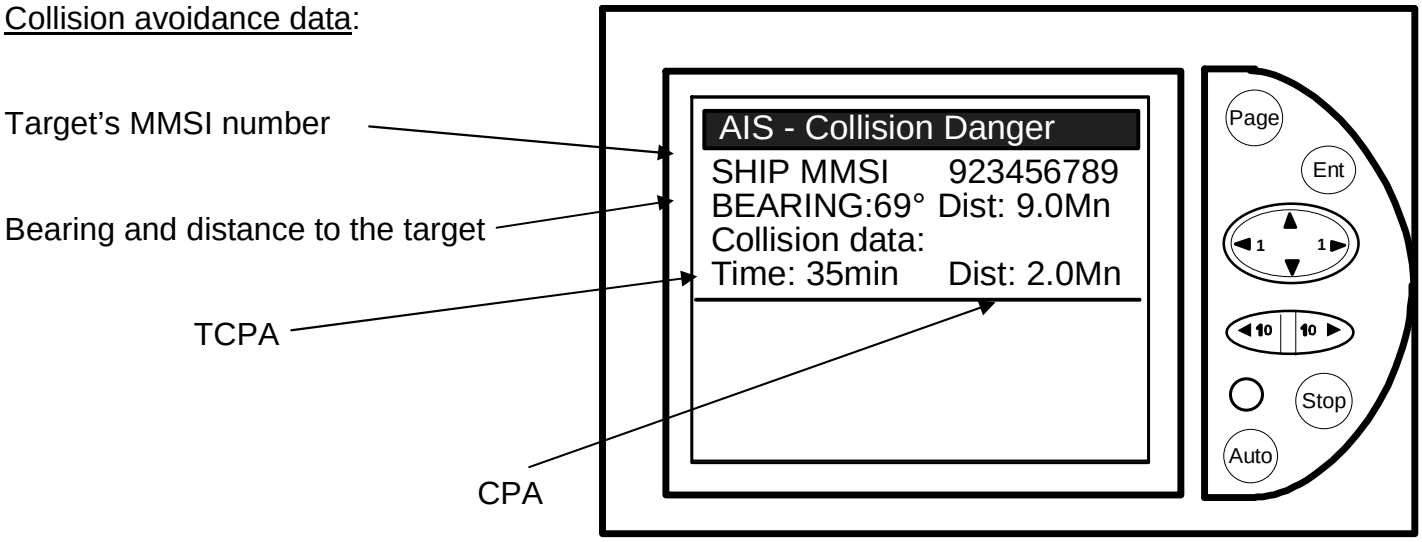


Press the Page button once to quit the alarm and display the collision avoidance data.

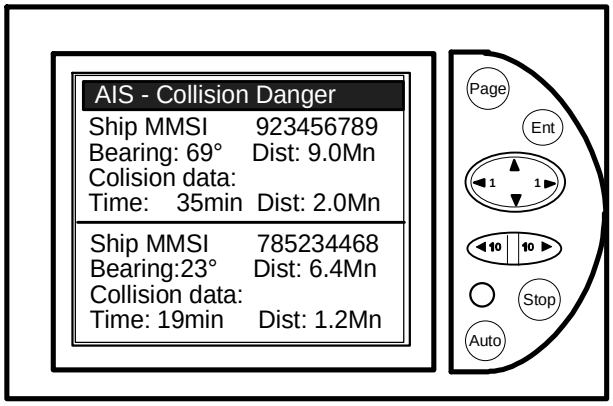
WARNING

Pressing the Page button quits the ***COLLISION ALERT*** page as long as the unit receives collision avoidance messages. It will be active again in standby mode 30 seconds after the reception of the last collision avoidance message.

Collision avoidance data:



The collision avoidance page can display data for two targets simultaneously. The target with the lowest ***CPA*** value will display on the top.



You can scroll through the pages “Pilot”, “Multifunction”, “Main Menu” and back to ***« A.I.S »*** at any time by pressing the Page button.

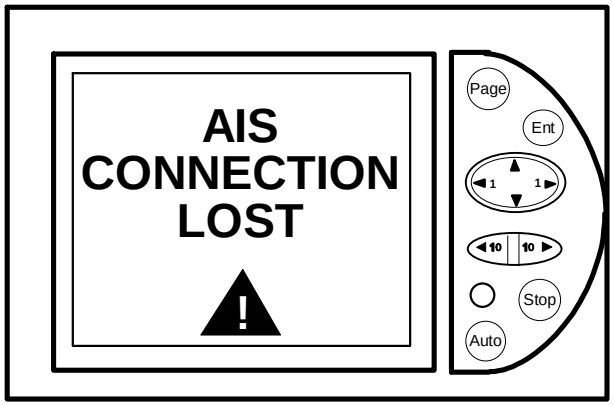
1.3.3. Fault states

1.3.3.1. No GPS signal (no-fix or out of order)

If the system receives invalid GPS sentences (GPS no-fix) the collision avoidance data will be processed with the last valid GPS position data received within the last 4 minutes. If GPS position data has been invalid for longer than 4 minutes, the **A.I.S.** page will be frozen and will no longer be available once the user displays another page (i.e. “Pilot”…).

1.3.3.2. Lost connection between the Gyrographic and the A.I.S Receiver/Processor

If the ***Gyrographic*** and the ***A.I.S Receiver/Processor*** are not able to communicate, the ***Gyrographic*** will display an alarm message.



1.4. TECHNICAL SPECIFICATION

- Dual frequencies (161.975 MHz – 162.025 MHz simultaneously)
- Sensitivity <-106dbm
- Processes both AIS class (A and B) messages
- Power supply: 12 volts
- Power consumption: ~ 100mA
- GPS input NMEA0183 (4800 bauds). Uses « RMC » NMEA sentence
- PC output NMEA0183 (38400 bauds). « RMC » sentences are multiplexed with A.I.S. messages.
- Protection IP20 (not waterproof)
- Weight 250g
- Dimensions: 145mm x 65 mm x 40 mm

2 FIRST-LEVEL TROUBLESHOOTING

In this section you will find information to help you handle small problems yourself. Please take time to read the table for solutions before calling technical support.

Issue	Possible Causes and solutions
GPS is powered on but the LED indicator does not flash green	Check the GPS output. NMEA 4800 bauds and « RMC » sentence outputs are required.
The LED indicator does not flash red, while a vessel transmitting A.I.S. is in range	Check wiring for VHF antenna or splitter
The PC navigation software does not read any A.I.S nor GPS data	Check the serial port parameters. The RS232 input must be 38400 bauds

In the event that you cannot solve the problem by yourself, please contact you dealer.

3 INSTALLATION

3.1. LIST OF ACCESSORIES

- 90-60-417: Topline connection kit. Junction box and cables.

3.2. INSTALLATION CAUTION

The ***A.I.S Receiver/Processor*** is not waterproof. It must be installed in a protected environment.

3.3. MOUNTING THE A.I.S. RECEIVER/PROCESSOR UNIT

The unit is fastened with Ø 4mm screws.

Dimensions in mm

Figure 3

3.4. CONNECTING THE A.I.S. RECEIVER/PROCESSOR UNIT

WARNING

All Topline bus connections must be performed while the system is powered off. The ***Gyrographic*** chosen to display A.I.S data must be exclusively dedicated and not receive any other NMEA data.

Run the cable from the junction box situated near the dedicated ***Gyrographic*** to the A.I.S. display.

- Connect the white wires and the shield in the junction box
- Connect the green wire to NMEA – position, and the yellow wire to NMEA+ position
- Use the BNC socket to connect either the VHF antenna that you dedicate to A.I.S., or the splitter box if you use the existing VHF antenna.
- Connect the GPS to the GPS input. Check that the GPS unit outputs « RMC ».
- Connect the 9 pin plug to the serial port of the PC running navigation software with A.I.S. features. Use either a serial RS232 port or a USB/RS232 adaptor.

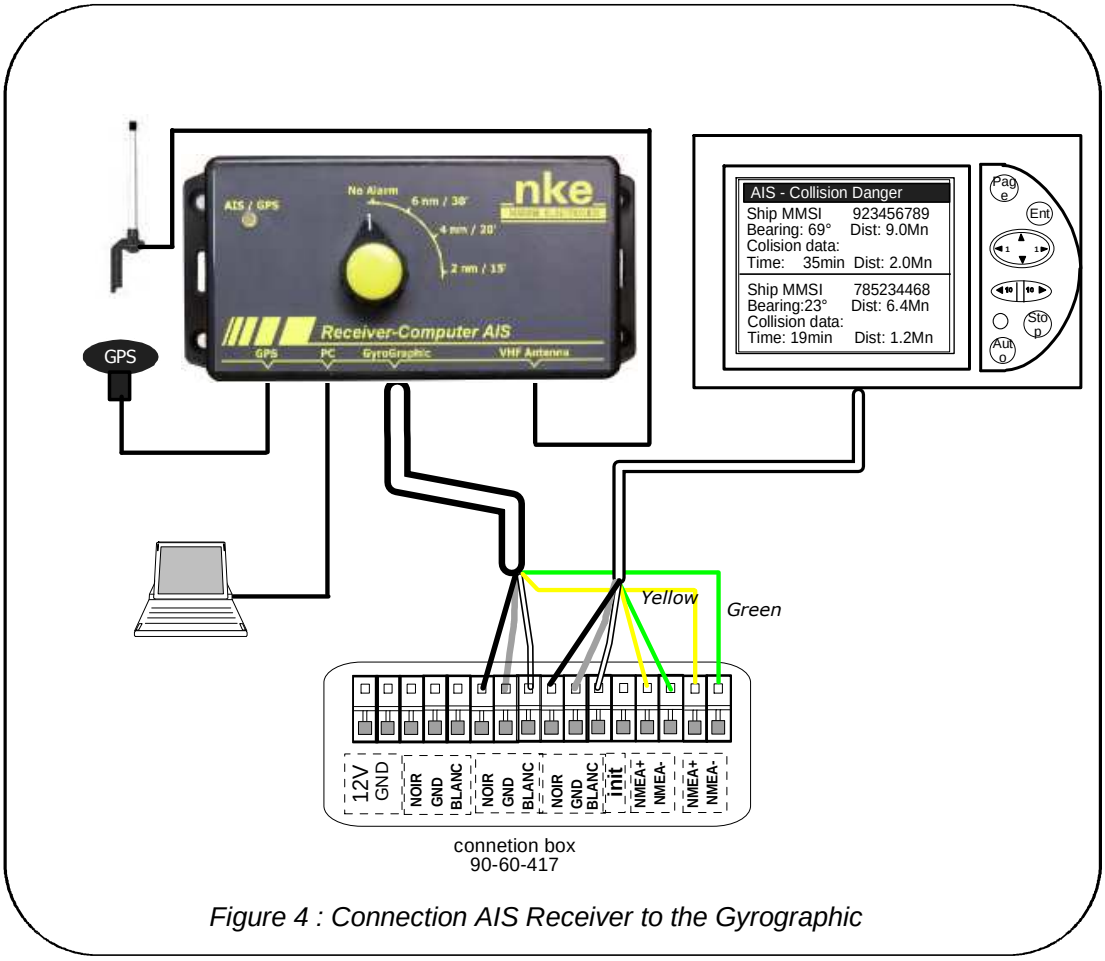


Figure 4 : Connection AIS Receiver to the Gyrographic

Should you need to reduce cables lengths, we recommend tinning the ends before connecting.

- ***Gyrographic* cable wires color codes**

Gyrographic cable wires	Function
White	+ 12 volts
Shield	GND
Black	NC
Red	NC
Yellow	+ NMEA
Green	- NMEA

- ***GPS* connection cable wires color codes**

GPS cable	Function
Brown	+ NMEA
White	- NMEA

- ***PC* connection cable wires color codes**

PC cable	Function
Brown	+ NMEA (pin 2 bD)
White	- NMEA (pin 5 bD)

4 GLOSSARY

AIS

(Automatic Identification System) is a worldwide navigation information exchange system. It is automated and permits vessels and shore stations to exchange information such as identity, status, position and route using the VHF radio signal.

MMSI

(Maritime Mobile Service Identity), is a unique 9 digit code which identifies each vessel.

CPA

(Closest Point of Approach) is the shortest distance to the meeting point of two vessels in approach.

TCPA

(Time Closest Point of Approach) is the time remaining until CPA .