

### 9 AXIS E-COMPASS MANAGER PC SOFTWARE FOR ONWA GPS ELECTRONICS COMPASS KA-GC9A

KA-GC9A is used to replace our previous product KA-GCxx. The advantages of KA-GC9A are:

- 1) Quicker response rate (real-time)
- 2) User programmable
- 3) More stable heading output
- 4) Provide online upgrade
- 5) Wider supply voltage



# 1) **PREPARATION**

- You need to prepare a RS232 -> USB converter (suggested to use LX08A)



- Connect KA-GC9A to LX08A as shown below



KA-GC9A

Connect KA-GC9A to LX08A

- Insert LX08A to any USB port of your PC



### **INSTALL THE LX08A DRIVER**

 Download the LX08A driver from the link below: <u>https://www.dropbox.com/s/kjbnn0gtiydiyeq/CH341SER.EXE?dl=0</u>

- Install the LX08A driver 🤬 CH341SER.EXE in your PC

Select INF File :	CH341SER.INF
INSTALL	WCH.CN
UNINSTALL	[11/U4/2U11, 3.3.2U11.11
HELP	

# 2) DOWNLOAD AND INSTALL "9 AXIS E-COMPASS MANAGER"

- Download the "9 axis E-Compass Manager" PC software 🔀 9 axis E-Compass installer.msi from the link below

https://www.dropbox.com/sh/cg16vk40xdvicra/AABGsiQPFBgy4i -B8J7q66ca?dl=0

- Follow the instructions below on how to install 🔀 9 axis E-Compass installer.msi
- During Installation, you will see a prompt as shown below, and you will need to connect your PC to the internet and click [Yes] to start download and install ".NET Framework 4.5"

명 axis E-Compass	×
This setup requires the . and run this setup again you like to do this now?	NET Framework version 4.5. Please install the .NET Framework The .NET Framework can be obtained from the web. Would
	Yes No

- The website below will automatically pop-up. Please click [Download] to obtain

Microsoft .NE	T Framework 4.5		
Select Language:	English	•	Download

.NET Framework 4.5 is a highly compatible, in-place update to .NET Framework 4.



- Follow the instructions below to finish the installation of "The .NET Framework version 4.5"

Sincrosoft .NET Framework 4.5	
.NET Framework 4.5 Setup Please accept the license terms to con	ntinue.
MICROSOFT SOFTWARE SU	IPPLEMENTAL LICENSE TERMS
.NET FRAMEWORK 4.5 FOR SYSTEM AND ASSOCIATED	MICROSOFT WINDOWS OPERATING LANGUAGE PACKS
Microsoft Corporation (or bas affiliates) licenses this supple Microsoft Windows operating may use this supplement. Yo	sed on where you live, one of its ement to you. If you are licensed to use g system software (the "software"), you u may not use it if you do not have a
✓ I have read and accept the licer	nse terms.
Download size estimate:	47 MB
Download time estimates:	Dial-Up: 115 minutes Broadband: 8 minutes
	Install Cancel

Signature Microsoft .NET Framewor	k 4.5	
Installation Progress Please wait while the .NET	Framework is being installed.	Mkrosoft" .NET
Download progress:		4
Downloading netfx_Full.m	122	
Installation progress:		0
Installing necessary comp	onents for .NET Framework	
		Cancel
🍕 Microsoft .NET Framewo	rk 4.5	
Microsoft .NET Framewo	<sup>rk 4.5</sup> Installation Is Complete	
Microsoft .NET Framework	rk 4.5 Installation Is Complete .NET Framework 4.5 has been installed.	
Microsoft .NET Framewo	rk 4.5 Installation Is Complete .NET Framework 4.5 has been installed.	
Microsoft .NET Framewo	rk 4.5 Installation Is Complete .NET Framework 4.5 has been installed. Check for more recent versions on <u>Windows 1</u>	Jodate,
Microsoft .NET Framewo	rk 4.5 Installation Is Complete .NET Framework 4.5 has been installed. Check for more recent versions on <u>Windows 1</u>	Jodate,
Microsoft .NET Framewo	rk 4.5 Installation Is Complete .NET Framework 4.5 has been installed. Check for more recent versions on <u>Windows 1</u>	Jodate,

- Re-run 📴 9 axis E-Compass installer.msi again to finish the installation of "9 axis E-Compass Manager".



병 9 axis E-Compass	
Select Installation Folder	
The installer will install 9 axis E-Compass to the following folder.	
To install in this folder, click "Next". To install to a different folder, enter it bel	ow or click "Browse".
<u>F</u> older:	
C.\Program Files (x86)\Onwa\9 axis E-Compass\	Browse
[	Disk Cost
Install 9 axis E-Compass for yourself, or for anyone who uses this computer	r.
Everyone	
O Just me	
Cancel < Back	Next >





関 9 axis E-Compass			
Installation Complete			
9 axis E-Compass has been successfully i	installed.		
Click "Close" to exit.			
Please use Windows Update to check fo	r any critical updat	es to the .NET Fram	ework.
	Cancel	< Back	Close

# 3) HOW TO USE "9 AXIS E-COMPASS MANAGER"

- Run "9 axis E-Compass Manager", it will auto detect the COMPort and baud rate. You will see a Green
  - Word "Connected" as shown below.

OUTION STOR CONTINUED REPORT	Magnetic deviatio	n offset setup	About					
Navigation data								
Magnetic headin Roll : Mag. deviation : Rate of turn (X) :	g :	GPS head Pitch : UTC time : Rate of tur	ing(COG) : : 03:51:34 n (Y) :	343.81°	Speed (kno Longitude : Date : 22/0 Rate of turr	ots) : 0.01 11413.9799 E 4/16 u (Z) :	Sat. in use Latitude : Fix Status Tempera	e : 05 2216.9375 N : GPS fix ture :
Baud rate 4800	9600	19200	38400		COM	19 - 4800 baud		Scan
Messages contro	LL 🔲 GMS	GNS	🗐 GSA	SSV	RMC	ZDA	VTG	Scan
\$GPHDT messa 1 time/sec	ge output per 5 time	second s/sec	🛅 10 tir	mes/sec				Scan
NMEA standard	messages m	onitor						
\$GNGSA.A3 \$GNGSA.A3 \$GNGLL221 \$GPGGA.03 \$GPHDT.025 \$GPHDT.025 \$GPHDT.025 \$GPHDT.025	683.1,1,7 ,26,16,32,31,29, 5,9375,N,11413, 1134,000,2216.9 9,5,T*0E 9,5,T*0E 9,5,T*0E 9,5,T*0E 9,5,T*0E	2.6*22 3.1,1.7,2 9799,E.035 375,N,1141	.6*27 134.000,A,/ 3.9799,E,1,	4*40 05.1.7.12.5.M	0.8.M0000	*7B	Î	Disable NMEA output Enable
SGPHDT.025 SGNRMC.03	9.5,T*0E 5133.000,A,2216	.9375,N,11	413.9799,E	.0.01,343.81.	220416A*7	F	*	NMEA output

### 3.1) Output setting

You can set the following items:

- A) Output baud rate
- B) Output NMEA sentences
- C) Heading (HDT) output intervals

- Click [Scan] to check the original settings in your KA-GC9A.

Click [Scan] to check output NMEA sentences

tomnor and con	ununication	Magnetic dev	viation offset setup	About			$\mathbf{X}$		
Navigat	tion data								
Magne Roll : Mag. o Rate o	etic headir deviation : of turn (X) :	ig:	GPS head Pitch : UTC time Rate of tur	ling(COG) : : 06:22:31 m (Y) :		Speed (kn Longitude Date : 22/0 Rate of turr	ots) : 4/16 h (Z) :	Sat. in us Latitude Fix Statu Temper	se : 00 : s : no fix ature :
Baud ra	ite 00 E	9600	19200	38400		COM	49 - 4800 ba	bue	Scan
Messac	es contr	ol							
GG GG	A 🔽 G	LL 🔳 GN	AS GNS	GSA	GSV	RMC	ZDA	VTG	Scan
sG sG sG	PHDT.020 PHDT.020 NVTGT. NRMC.06	58.0, T*09 58.0, T*09 M., N., K.N*3 2231.020, V.,	2 220416N*5	6					Disable NMEA output
sG sG sG sG sG sG	NGSA.A.1 NGLL0 PGGA.06 PHDT.020 PHDT.020 PHDT.020	*00 62231.020.V 2231.0200 58.0.T*09 58.0.T*09 58.0.T*09 58.0.T*09	.N*62 ),00M,0.0.M.,0	000*50				-	Enable NMEA output
			9 Axis E	-Compa	ass	Corne	cted		

Click [Scan] to check heading output intervals

- From the above figure you can see the original data of KA-GC9A after clicking [Scan] :

- A) Output baud rate: 4800
- B) Output NMEA sentences: GGA, GLL, GSA, RMC
- C) Heading output intervals: 5Hz

- To change any of the above settings,

A) To change the Output Baud rate:

Ex: 38400

(Check the box beside [38400])

B) To Add output NMEA sentences:

Ex: GSV & VTG

(Check the box beside [GSV] and [VTG], if you want to de-select just simply uncheck the related box.)

C) To Change the Heading output intervals:

Ex: 10Hz

(Check the box beside [10 times/sec])



Note : Changes will be completed when you check on the box or boxes.

# **SUGGESTED SETTING FOR DIFFERENT APPLICATIONS:**

	Baud rate	Output NMEA sentences	Heading output intervals
KA-GC9A_05(for KEC30G)	4800	RMC, GSA, GGA, GMS, ZDA	5 times/sec
KA-GC9A_10(for KAP866)	4800		10 times/sec
For others applications	Will depend on	RMC, GSA, GGA, GLL, VTG	5 times/sec
(Radar, Plotters, etc.)	the application		

Note: Heading (HDT) is a must sentence, you can only choose the output intervals

### 3.2) Magnetic deviation offset set-up

Aside from changing the output setting of KA-GC9A, the user can also set magnetic deviation and computation parameters.

**Automatic computation:** KA-GC9A has built-in GPS module, we can use COG data to correct heading error. The user can set the below computation parameters:

A) Minimum speed threshold (knots)

Automatic error computation will carry out in certain speed.

B) Time for offset validation (sec)

Automatic error computation will carry out when COG keep within +/-1 degree within certain set time in second.

Example : If [Minimum speed threshold] is set to 8 knots and [Time for offset validation] is set to "5 sec" then the auto error computation will only carry out when the SOG reach 8 knots or above (the set [Minimum speed threshold]) and COG keeps the course within +/-1 degree for 5 seconds (the set [Time for offset validation]).

If the user sets [Automatic computation or fixed] to "fixed" then the automatic computation function is turned off.

### Magnetic deviation offset setup

A) Select "Magnetic deviation offset setup"

Monitor and communication Magnetic deviation	an offset setup About		
Magnetic deviation and computation	parameters	N	(Geographic)
Magnetic deviation :	0 degree 👻	A	N (Magnetic)
Automatic computation or fixed :	Fixed -		
Time for offset validation (sec) :	· · · ·		
Get values	Set values		Equator
NMEA proprietary command m	onitor	S (Geographic)	North Geographic Heading
\$PNOVA02,KATE SET '08 \$PNOVA00,PSRF OK *59 \$PNOVA00,PSRF OK *59		(0003.01)	North Magnetic Heading
		Angle of	East Declination
		declination —	West Declination
When the automatic computation o North is enabled (also call declinati - (1) The speed of the vessel is gre - (2) The course over ground (COG)	f the magnetic offset variation in be ion), the magnetic variation is recon aler than the speed threshold (1.0 t is not varying more than +/- 1 degr	ween the magnetic North i led when : 20.0 knots selectable) se	and the true geographical
ç	Avis E-Compass	Connected	

B) Click [Get values] to read the preset value in KA-GC9A( default is 0 degree)

Monitor and communication Magnetic deviation offset setup About Magnetic deviation and computation parameters Magnetic deviation : Automatic computation or fixed : Automatic computation or fixed : Minimum speed threshold (knots) : Time for offset validation (sec) : Get values NMEA proprietary command monitor \$PNOVA10,08.0,5,E01.0,0*0E	N (Geographic) N (Magnetic) Equator S (Geographic) North Geographic Heading North Magnetic Heading Angle of declination West Declination
North is enabled (also call declination), the magnetic varia	on is recorded when :
- (1) The speed of the vessel is greater than the speed thr	whold (1.0 to 20.0 knots selectable)
- (2) The course over ground (COG) is not varying more than	++- 1 degree
9 Axis E-Comp	asss Connected

 C) Click [Magnetic deviation] to change magnetic deviation degree and direction (It is suggested NOT to change the magnetic deviation unless there are installation errors or you are sure about the magnetic deviation)



D) If you want automatic computation you can change [Automatic computation or fixed] from "Fixed" to "Automatic"

Monitor and communication Magnetic deviation offset setup About	
Magnetic deviation and computation parameters           Magnetic deviation :         East 1 degree	N (Geographic)
Automatic computation or fixed :       Fixed         Minimum speed threshold (knots) :       Automatic         Time for offset validation (sec) :       Time for offset validation (sec) :         Get values       Set values	Equator
NMEA proprietary command monitor \$PNOVA02,RATE SET*08 \$PNOVA00,PSRF OK*59 \$PNOVA00,PSRF OK*59	S (Geographic) Angle of declination
When the automatic computation of the magnetic offset variation in b North is enabled (also call declination), the magnetic variation is reco - (1) The speed of the vessel is greater than the speed threshold (1.0 - (2) The course over ground (COG) is not varying more than +/- 1 deg	etween the magnetic North and the true geographical orded when : to 20.0 knots selectable) tree
0 Avia E Company	Composed

After you change error computation from "Fixed" to "Auto" then you need to set [Minimum speed threshold] and [Time for offset validation] as well

E) Change [Minimum speed threshold]



Changing the [Minimum speed threshold] to **8 knots** or above is recommended unless the KA-GC9A is used as a slow boat.



F) Change [Time for offset validation]

*Changing the [Time for offset validation] to* **5** *seconds or above is recommended.* 

G) Remember to click [Set values] to save the changes after settings.

i訊明(H)				
ONWA 9 axis E-Compass Manager				
Monitor and communication Magnetic deviatio	noffset setup About			
Magnetic deviation and computation Magnetic deviation :	parameters East 1 degree  ▼	N (G	eographic) N (Magnetic)	
Automatic computation or fixed :	Automatic 👻	AL CHAR	A	
Minimum speed threshold (knots) :	8.0 knots 👻			
Time for offset validation (sec) :	5 sec 👻		Equator	
Get values	Set values		4	
NMEA proprietary command m \$PNOVA11,0K*6E \$P <del>NOVA:1,000,5</del> ,601.0,0*0E	onitor	S (Geographic)	North Geographic Heading North Magnetic Heading	
		Angle of declination	West Declination	
When the automatic computation o North is enabled (also call declinati - (1) The speed of the vessel is gre - (2) The course over ground (COG)	f the magnetic offset variation in bo ion), the magnetic variation is reco ater than the speed threshold (1.0 is not varying more than +/- 1 deg	etween the magnetic North and rded when : to 20.0 knots selectable) ree	d the true geographical	
S	Axis E-Compass	Connected		

You can see this message appear on this window when you click [Set values] to confirm successful save of changes.

# **APPENDIX A**

ONWA's new version 4.0.0 9-axis E-Compass Manager, a new function was added to detect whether the customer had chosen too many output sentences against lower baud rate :

Example : if a customer choose 4800 baud rate but at the same time he had chosen too many GPS NMEA output sentences and high heading output intervals as below, then a red text <u>"RS232 UART</u> <u>communication status : OVERLOAD"</u> will appear to warn the customer he had chosen too many GPS NMEA output sentences.

Navigation data		
Magnetic heading: 243.0°         GPS heading(COG):           Roll: 1.9°         Pitch: 0.5°           Mag. deviation: 0.0° (East)         UTC time: 04:45:32           Rate of tum (X): 0°/sec         Rate of tum (Y): 0°/sec	Speed (knots):         Sat. in use: 00           Longitude:         Latitude:           Date: 06/06/16         Fix Status: no fit           Rate of fum (2):         0'/sec	x 29.1°
P		
▼ 4800	COM9 - 4800 baud Sc	an
Messages control - status		
GGA GLL GMS GMS GSA GSA	SV RMC VTG Sc	an
RS232 UART communic	ation status : OVERLOAD	
RS232 UART communication \$GPHDT message output per second	ation status : OVERLOAD	
SGPHDT message output per second	ation status : OVERLOAD	an
SGPHDT message output per second 1 time/sec  5 times/sec  10 times/sec	ation status : OVERLOAD	an
SGPHDT message output per second 1 time/sec  S 5 times/sec  10 times/sec NMEA standard messages monitor	ation status : OVERLOAD	an
SGPHDT message output per second 1 time/sec  SGPHDT message monitor SGNGLL044532.370.V.N°64 SGNGNS 044532.370.V.N°64	ation status : OVERLOAD	an
RS232 UART communic         \$GPHDT message output per second         1 time/sec       5 times/sec         1 time/sec       \$ 5 times/sec         NMEA standard messages monitor         \$GNGLL044532.370N*64         \$GNGNS.044532.370N.000.0.0000*63         \$GPGGA.044532.370N.00M.00.M.0000*56	ation status : OVERLOAD	an Ible IEA put
RS232 UART communic         \$GPHDT message output per second         1 time/sec       5 times/sec         I time/sec       \$ 5 times/sec         NMEA standard messages monitor         \$GNGLL044532.370NN.064         \$GNGNS.044532.370NN.000.0.0000°63         \$GPGGA.044532.370NN.000.0.0000°56         \$GPHDT.0243.0.1°00         \$GPDT.0243.0.1°00	ation status : OVERLOAD	an sble EA put
SGPHDT message output per second           1 time/sec         5 times/sec         10 times/se           SGNGLL044532.370.V.N*64         \$GNGNS.044532.370N.N0000.0000*63         \$GPGA0.044532.370N.N0000.0000*56           \$GPHDT.0243.0.7*00         \$GPGMS.243.0.0000.0000.5.0001.9.002430187.0000.00.	ation status : OVERLOAD	an Isble EA put
SGPHDT message output per second           1 time/sec         5 times/sec         10 times/se           SGNGLL044532.370.V.N*64         SGNGNS.044532.370NN.0000.0000*63         SGPGA.044532.370NN.0000.000*65           SGPHDT.0243.0.7*00         SGPHDT.0243.0.7*00         SGPHDT.0243.0.7*00           SGPHDT.0243.0.7*00         SGPHDT.0243.0.1*00         SGPHDT.0243.0.7*00	ation status : OVERLOAD	an bble EA put
SGPHDT message output per second           1 time/sec         5 times/sec         10 times/se           SGNGLL044532 370.V.N*64         SGNGIL044532 370.V.N*64           SGNGSNS.044532 370NN.000.0.0000*63         SGPGGA,044532 370NN.0000.0000*56           SGPHDT.0243.0.7*00         SGPHDT.0243.0.7*00           SGPHDT.0243.0.7*00         SGPHDT.0243.0.7*00           SGPHDT.0243.0.7*00         SGPHDT.0243.0.7*00           SGPHDT.0243.0.7*00         SGPHDT.0243.0.7*00	ation status : OVERLOAD	an bble EA put bble EA put

The user can fix this by:

- A) de-select some GPS NMEA output sentences Or
- B) choose lower heading output intervals

The user sees a green text that shows <u>"RS232 UART communication status : OK"</u> when all his settings are OK, as shown below :

nitor and communication Magnetic deviati	on offset setup About			
Navigation data		Course of Courses		
Roll: 2.0°	Pitch: 0.5*	Longitude :	Sat in use : 00 Latitude :	
Rate of turn (X): 0'/sec	Rate of turn (Y): 0'/sec	Rate of turn (Z): 0°/sec	Temperature : 29.	.3*
Baud rate 4800 9600	19200 🕅 38400	COM9 - 4800 baud	Scan	
🗹 GGA 🔍 GLL 📃 GMS	GNS GSA GS	RMC VTG	Scan	
GGA GLL GMS	GNS QGA GS RS232 UART communice r second Is/sec 10 times/sec	I IRMC IVTG tion status ; OK	Scan	
GGA GLL GMS SGPHDT message output pe 1 time/sec 5 time NMEA standard messages m	GNS GSA GSA RS232 UART communice r second ss/sec 10 times/sec nonitor	I RMC VTG	Scan	
GGA GLL GMS GGPHDT message output pe T time/sec 5 time SGPHDT.0243.1.T'01 SGPHDT.0243.1.T'01 SGPHDT.0243.0.T'00 SGPHDT.0255.0.T'00 SGPHDT.0	GNS Q GSA GSI RS232 UART communica r second rs/sec 10 times/sec tonitor	/ IR RMC V VTG	Scan Scan Disable NMEA output	

### APPENDIX B

ONWA's newest version 4.0.1 9-axis E-Compass Manager, A "Get version" function was added for the user to check the firmware version of his KA-GC9A module. This can be used when he reports a software bug of KA-GC9A.

lavigation data					
Magnetic heading:	GPS head	fing (COG)	Speed (knots	): s	sat in use :
Roll:	Pitch .		Longitude :	· .	atitude :
Mag. deviation :	UTC time	8-2-3-	UTC date :		ix status :
Rate of turn (X):	Rate of tur	m (Y) :	Rate of turn (2	9	(emperature :
aud rate					
4800 9600	19200	38400	COM9	- 38400 baud	Scarving
lessages control - status					
GGA GLL C	MS GNS	GSA GS		VTG	Scan
GPHDT message output	per second				-
GPHDT message output	per second 5 times/sec	10 times/sec			Scan
GPHDT message output 1 time/sec	per second 5 times/sec	10 tmes/sec	ot loader version :		Scan D Get version
APHDT message output 1 sme/sec Main firm MEA standard messages	per second 5 smes/sec ware version :	10 times/sec	ot loader version :	>	Scan Get version
GPHDT message output	per second 5 times/sec ware version : monitor	D 10 times/sec	ot loader version :		Scan Get version
GPHDT message output	per second 5 times/sec ware version : mohillor	D 10 times/sec Bo	ot loader version :	>	Scan Get version Deable NNEA oxford
APHDT message output	per second 5 times/sec ware version : monitor	D 10 times/sec	ot loader version :		Scan Get version Deable NMEA output
GPHDT message output	per second 5 times/sec ware version : mohilior	D 10 times/sec Bo	ot loader version :		Scan Get version Dashte NMEA oxford Finable

9 Axis E-Compass Disconnected