NMEA 0183 Driver

Supported version TOP Design Studio V1.0 or higher

CONTENTS

We want to thank our customers who use the Touch Operation Panel.

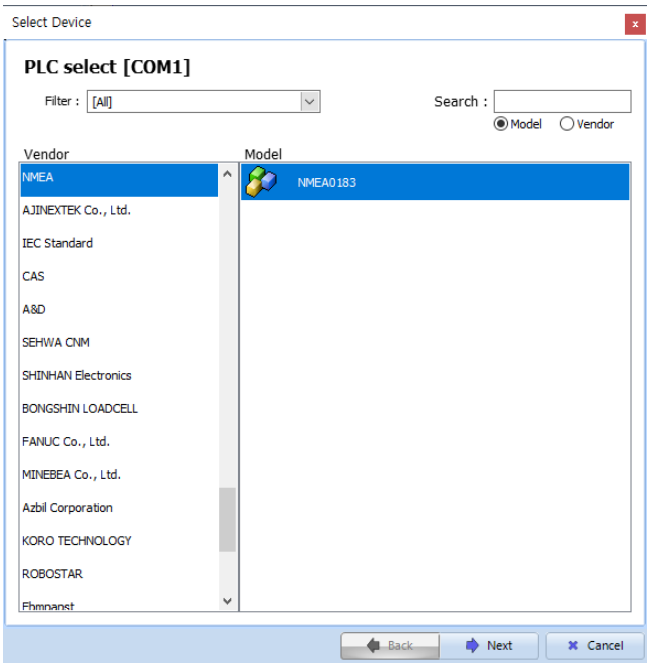
1. System configuration

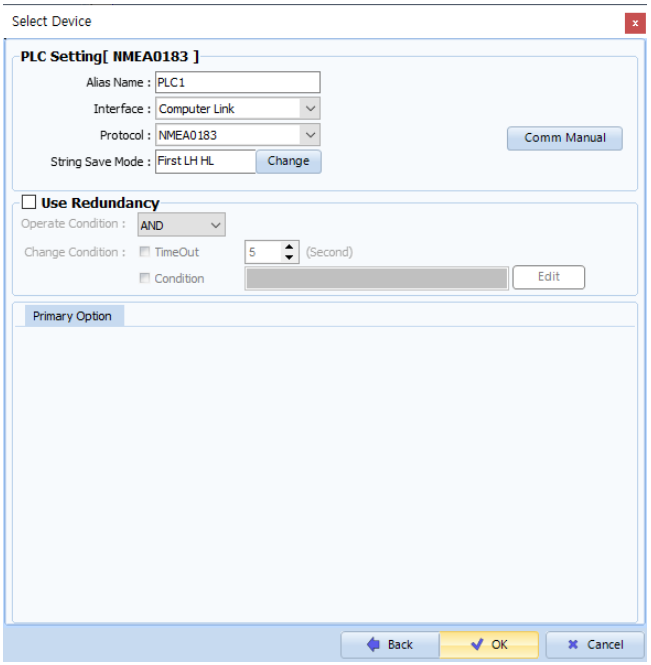
The system configuration of TOP and "NMEA 0183" is as follows:

Series	CPU	Link I/F	Communication method	Communication setting	Cable
NMEA 0183	-	-	RS–232C	3. TOP communication setting 4. External device setting	5. Cable table

2. External device selection

■ Select a TOP model and a port, and then select an external device.





Settings		Contents
TOP	Model	Check the TOP display and process to select the touch model.
External device	Vendor	Select the vendor of the external device to be connected to TOP. Select "NMEA0183".
	PLC	Select an external device to connect to TOP.

Model	Interface	Protocol
NMEA0183	Computer Link	NMEA0183

Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system can be configured.

3. TOP communication setting

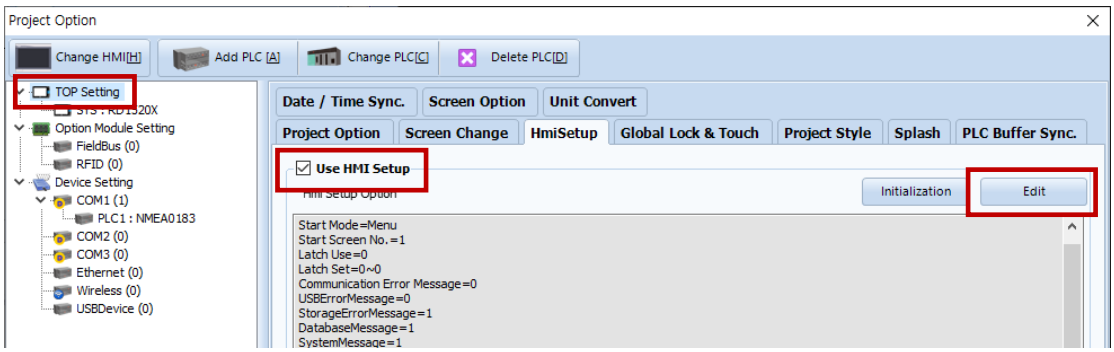
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

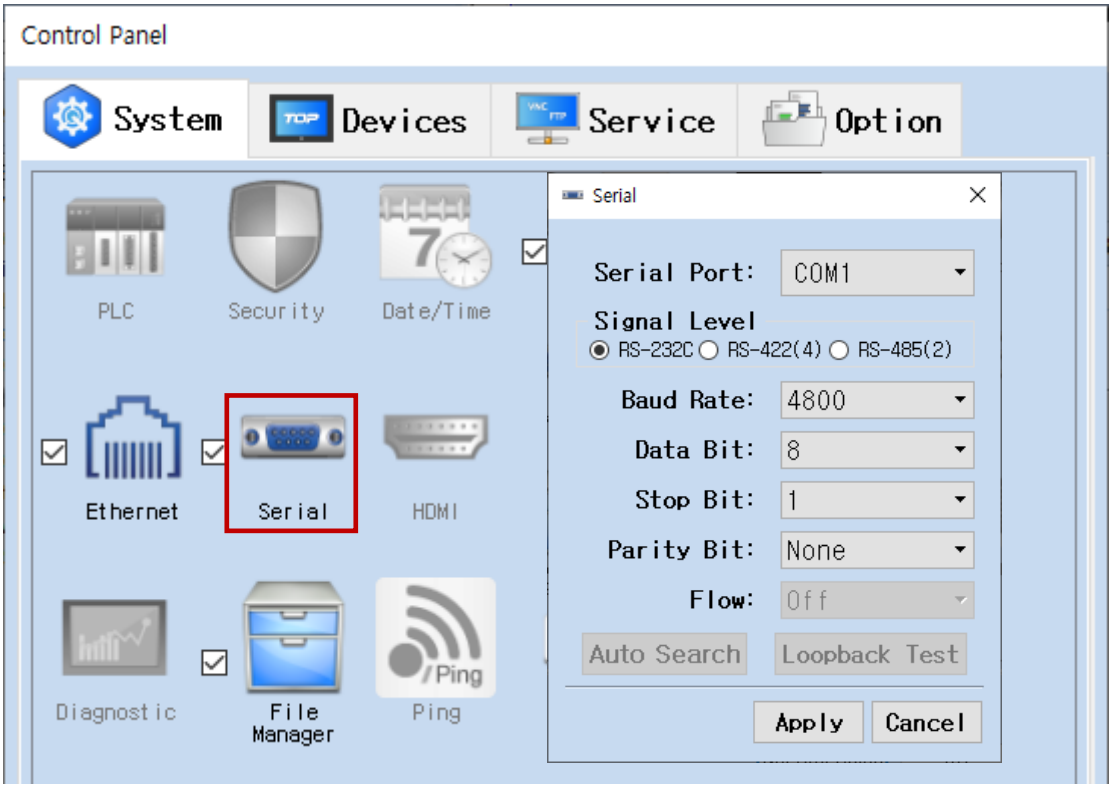
3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

■ [Project > Project Property > TOP Setting] → [Project Option > "Use HMI Setup" Check > Edit > Serial]

– Set the TOP communication interface in TOP Design Studio.





Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	4800		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

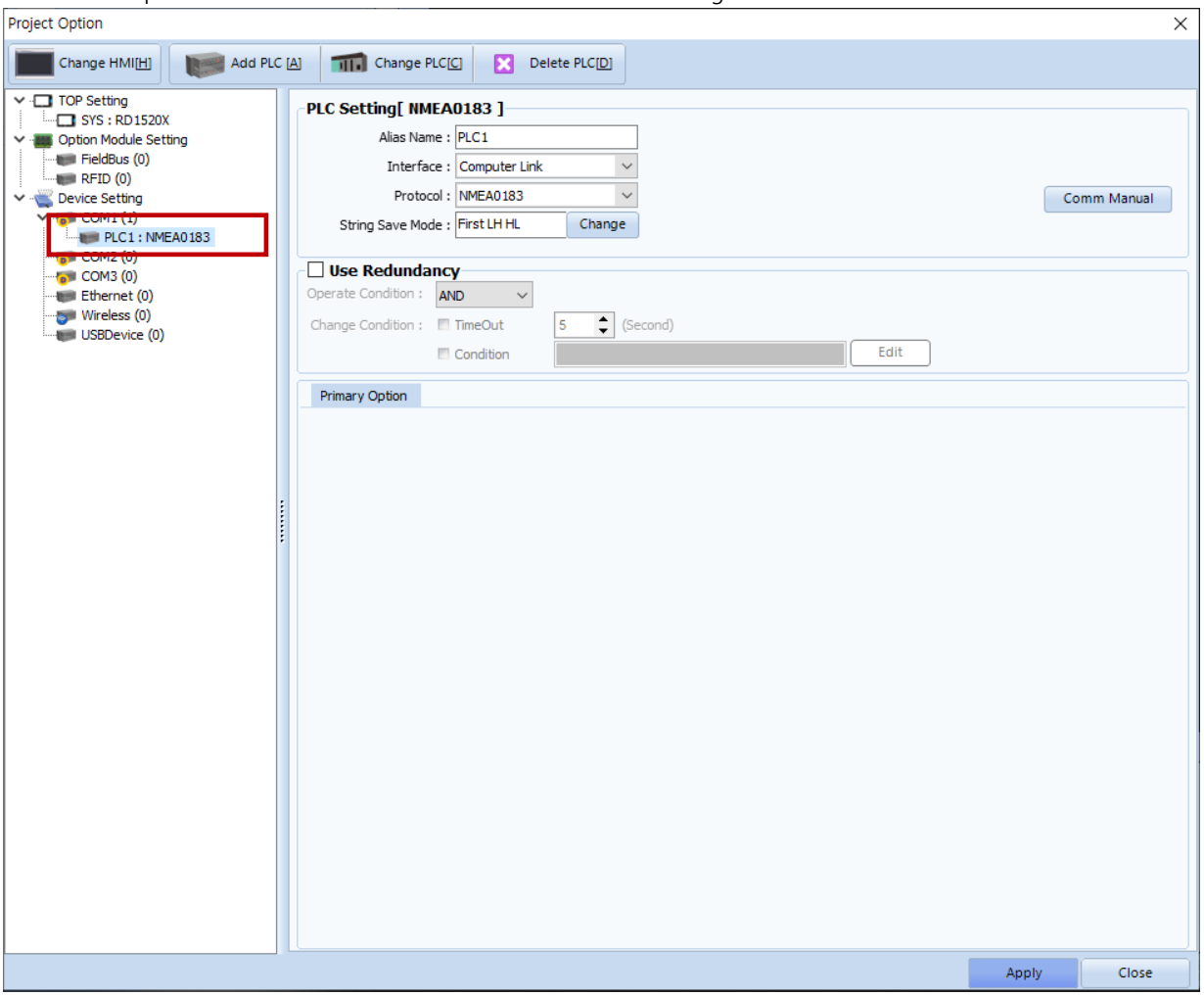
* The above settings are examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Project > Project Property > Device Setting > COM > "PLC1 : NMEA0183"]

– Set the options of the NMEA0183 communication driver in TOP Design Studio.

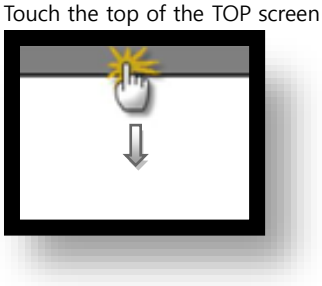


Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External device selection".
Protocol	Select "NMEA0183".	

3.2. Communication setting in TOP

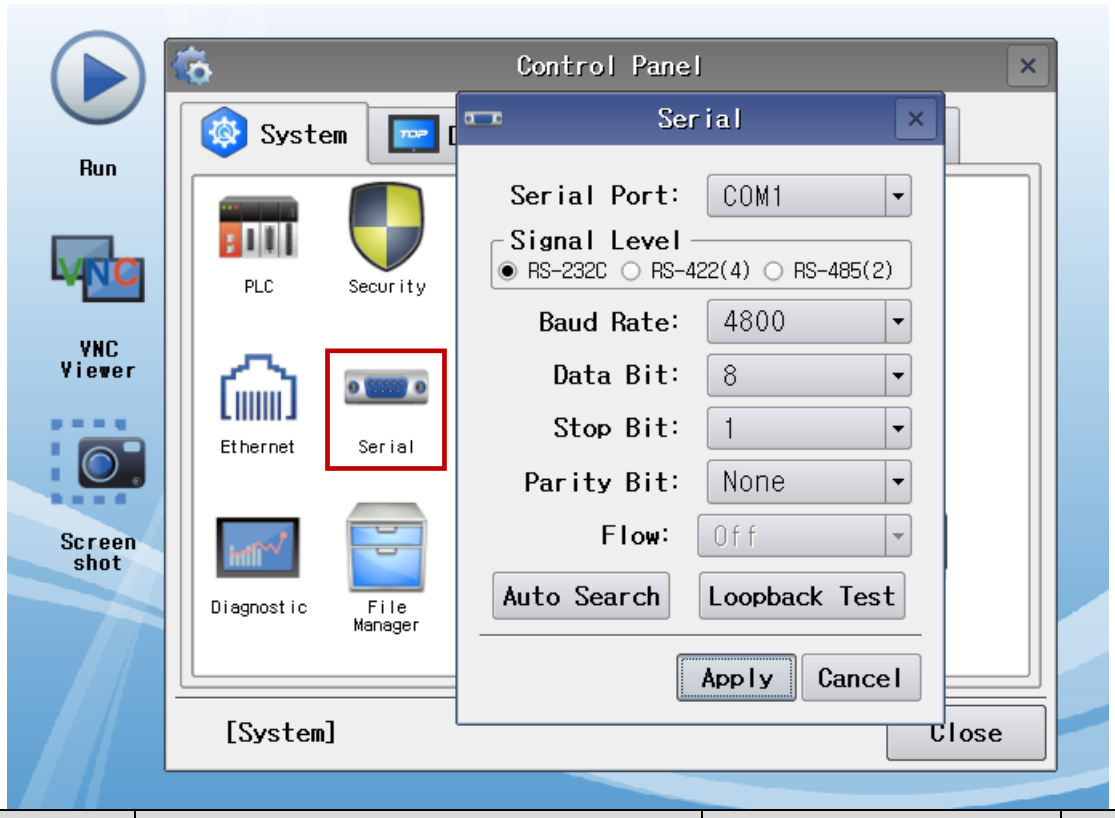
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.



(1) Communication interface setting

■ [Main Screen > Control Panel > Serial]



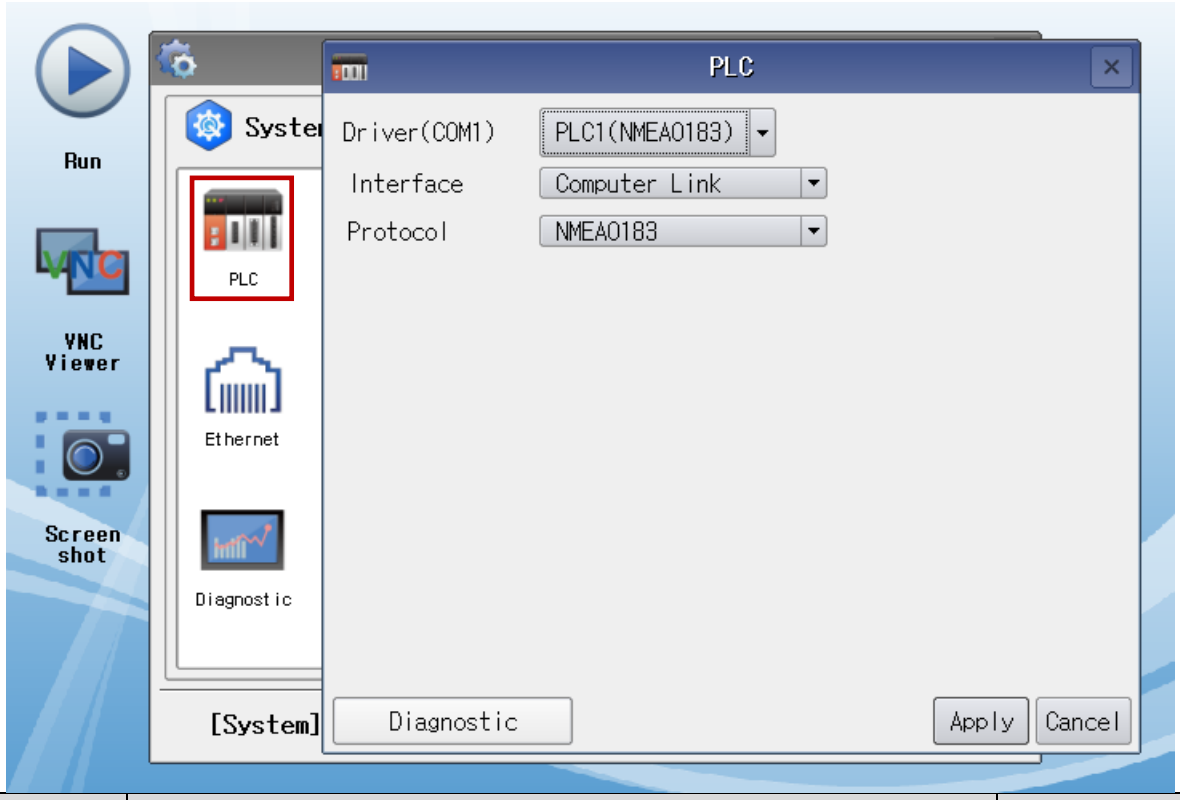
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	4800		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

* The above settings are setting examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Main Screen > Control Panel > PLC]



Items	Settings	Remarks
Interface	Select “Computer Link”.	Refer to “2. External device selection”.
Protocol	Select “NMEA0183”.	

3.3 Communication diagnostics

■ Check the interface setting status between the TOP and external device.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
- Check if the COM port settings you want to use in [Control Panel > Serial] are the same as those of the external device.

■ Diagnosis of whether the port communication is normal or not

- Touch "Communication diagnostics" in [Control Panel > PLC].
- The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

OK	**Communication setting normal**
Time Out Error	**Communication setting abnormal** - Check the cable, TOP, and external device setting status. **(Reference: Communication diagnostics sheet)**

■ Communication diagnostics sheet

- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents		Check		Remarks
System configuration	How to connect the system		OK	NG	1. System configuration
	Connection cable name		OK	NG	
TOP	Version information		OK	NG	2. External device selection 3. Communication setting
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	Relative prefix	Project setting	OK	NG	
		Communication diagnostics	OK	NG	
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name		OK	NG	4. External device setting
	Communication port name (module name)		OK	NG	
	Protocol (mode)		OK	NG	
	Setup Prefix		OK	NG	
	Other detailed settings		OK	NG	
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
	Check address range		OK	NG	6. Supported addresses (For details, please refer to the PLC vendor's manual.)

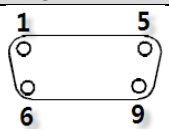
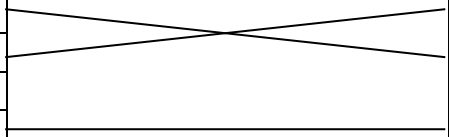
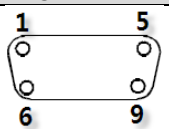
4. External device setting

Refer to the vendor's user manual to identically configure the communication settings of the external device to that of the TOP.

5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
(The cable diagram described in this section may differ from the recommendations of "NMEA0183")

■ **RS232C** (1:1 connection)

COM			Cable connection	External device		
Pin arrangement*Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement*Note 1)
 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	CD	1		1	CD	 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)
	RD	2		2	RD	
	SD	3		3	SD	
	DTR	4		4	DTR	
	SG	5		5	SG	
	DSR	6		6	DSR	
	RTS	7		7	RTS	
	CTS	8		8	CTS	
		9		9		

*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

6. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

	Device	Description	Device type
ZDA	ZDA01	UTC	FLOAT
	ZDA02	Day	DEC
	ZDA03	Month	DEC
	ZDA04	Year	DEC
	ZDA05	LocalZoneHours	DEC
	ZDA06	LocalZoneMinutes	DEC
XTE	XTE01	Status1	Character
	XTE02	Status2	Character
	XTE03	MagnitudeOfCrossTrackError	FLOAT
	XTE04	DirectionToSteer	Character
	XTE05	ModeIndicator	Character
VTG	VTG01	CourseOverGround	FLOAT
	VTG02	CourseOverGroundInd	Character
	VTG03	CourseOverGroundMagnetic	FLOAT
	VTG04	CourseOverGroundMagneticInd	Character
	VTG05	SpeedOverGroundKnots	FLOAT
	VTG06	SpeedOverGroundKnotsInd	Character
	VTG07	SpeedOverGroundKmh	FLOAT
	VTG08	SpeedOverGroundKmhInd	Character
	VTG09	ModeIndicator	Character
VHW	VHW01	Heading	FLOAT
	VHW02	HeadingInd	Character
	VHW03	HeadingMagnetic	FLOAT
	VHW04	HeadingMagneticInd	Character
	VHW05	SpeedKnots	FLOAT
	VHW06	SpeedKnotsInd	Character
	VHW07	SpeedKmh	FLOAT
	VHW08	SpeedKmhInd	Character
VDR	VDR01	Direction	FLOAT
	VDR02	DirectionInd	Character
	VDR03	DirectionMagnetic	FLOAT
	VDR04	DirectionMagneticInd	Character
	VDR05	CurrentSpeed	FLOAT
	VDR06	CurrentspeedInd	Character
RMC	RMC01	UTC	FLOAT
	RMC02	Status	Character
	RMC03	Latitude	FLOAT
	RMC04	LatitudeInd	Character
	RMC05	Longitude	FLOAT
	RMC06	LongitudeInd	Character
	RMC07	SpeedOverGround	FLOAT
	RMC08	CourseOverGround	FLOAT
	RMC09	Date	DEC
	RMC10	MagneticVariation	FLOAT
	RMC11	MagneticVariationInd	Character
	RMC12	ModeIndicator	Character

	Device	Description	Device type
RMB	RMB01	DataStatus	Character
	RMB02	CrossTrackError	FLOAT
	RMB03	DirectionToSteer	Character
	RMB04	OriginWaypointID	Character
	RMB05	DestinationwaypointID	Character
	RMB06	DestinationwaypointLat	FLOAT
	RMB07	DestinationwaypointLatInd	Character
	RMB08	DestinationWaypointLongitude	FLOAT
	RMB09	DestinationWaypointLongitudeInd	Character
	RMB10	RangeToDestination	FLOAT
	RMB11	BearingToDestination	FLOAT
	RMB12	DestinationClosingVelocity	FLOAT
	RMB13	Arrival Status	Character
	RMB14	ModeIndicator	Character
MWV	MWV01	WindAngle	FLOAT
	MWV02	Reference	Character
	MWV03	WindSpeed	FLOAT
	MWV04	WindSpeedInd	Character
	MWV05	Status	Character
MWD	MWD01	WindDirection	FLOAT
	MWD02	WindDirectionInd	Character
	MWD03	WindDirectionMagnetic	FLOAT
	MWD04	WindDirectionMagneticInd	Character
	MWD05	WindSpeedKnots	FLOAT
	MWD06	WindSpeedKnotsInd	Character
	MWD07	WindSpeedMs	FLOAT
	MWD08	WindSpeedMsInd	Character
MTW	MTW01	Temperature	FLOAT
	MTW02	TemperatureInd	Character
HDT	HDT01	Heading	FLOAT
	HDT02	HeadingInd	Character
HDG	HDG01	MagneticHeading	FLOAT
	HDG02	MagneticDeviation	FLOAT
	HDG03	MagneticDeviationInd	Character
	HDG04	MagneticVariation	FLOAT
	HDG05	MagneticVariation	Character
GSA	GSA01	Mode	Character
	GSA02	Mode	Character
	GSA03	Mode	DEC
	GSA04	Mode	DEC
	GSA05	ID	DEC
	GSA06	ID	DEC
	GSA07	ID	DEC
	GSA08	ID	DEC
	GSA09	ID	DEC
	GSA10	ID	DEC
	GSA11	ID	DEC
	GSA12	ID	DEC
	GSA13	ID	DEC
	GSA14	ID	DEC
	GSA15	PDOP	DEC
	GSA16	HDOP	FLOAT

	Device	Description	Device type
	GSA17	VDOP	FLOAT
GLL	GLL01	Latitude	FLOAT
	GLL02	LatitudeInd	Character
	GLL03	Longitude	FLOAT
	GLL04	LongitudeInd	Character
	GLL05	UTC	DEC
	GLL06	Status	Character
	GLL07	ModeIndicator	Character
GGA	GGA01	UTC	FLOAT
	GGA02	Latitude	FLOAT
	GGA03	LatitudeInd	Character
	GGA04	Longitude	FLOAT
	GGA05	LongitudeInd	Character
	GGA06	QualityIndicator	DEC
	GGA07	NumberOfSatellitesInUse	DEC
	GGA08	HorizontalDilutionOfPrecision	FLOAT
	GGA09	Altitude	FLOAT
	GGA10	AltitudeInd	Character
	GGA11	GeoidalSeparation	FOLAT
	GGA12	GeoidalSeparationInd	Character
	GGA13	AgeOfDifferentialData	FOLAT
	GGA14	DifferentialReferenceID	DEC
DBT	DBT01	WaterDepthFeet	FLOAT
	DBT02	WaterDepthFeetInd	Character
	DBT03	WaterDepthMeters	FLOAT
	DBT04	WaterDepthMetersInd	Character
	DBT05	WaterDepthFathoms	FLOAT
	DBT06	WaterDepthFathomsInd	Character
DPT	DPT01	WaterDepth	FLOAT
	DPT02	OffsetFromTransducer	FLOAT
	DPT03	MaximumRangeScale	FLOAT

* **For character devices:** must configure max number of rows to 4 or less when registering character tags.