## Changing NMEA2000 instances

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## 1. Introduction

Instances are used in an NMEA2000 network to identify multiple similar products connected on the same network.

As an example, take a system with two battery monitors (one for the main battery bank, and another for the hydraulic-thruster bank) and also a Quattro inverter/charger. All three of those devices will send their battery voltage measurements out on the canbus.

For the displays to show these values at the right place, they need to know which voltage belongs to what battery.

Before going ahead and change instances, please make sure to first study the NMEA2000-out chapter in the GX manual.

#### How can I change the instances?

This document describes three options:

- 1. Use Actisense software & hardware. Can change both the device- and data-instances
- 2. Use Maretron software & hardware.
- 3. From the commandline of a GX device. Note that this is a software developer trick. Not for any day use.

#### Device instance, data instances and other instances

There various types of instances. Please make sure to study the NMEA2000-out chapter in the GX manual before continuing.

In summary, and as per NMEA2000 specification, it should not be necessary to change a data instance such as the DC instance.

#### **Required hardware**

Changing the device instance requires an usb-canbus adapter to link the CAN-bus network to your computer:

- For Actisense, see the Actisense NGT-1
- For Maretron, see their USB100

#### **Related information**

For more detailed information, see also the FAQ in our Data communication whitepaper.

And the main NMEA2000 integration guide.

## 2. Changing the device instance with Actisense

Note: make sure to use a recent Actisense driver. Otherwise the instance might not 'stick'.

Changing a device instance:

- 1. Open Actisense NMEA Reader
- 2. Select the network view (tab selection is at the bottom left)
- 3. Select the product whose device instance you want to change
- 4. Select the properties tab at the bottom right and change the device instance

	A Reader - [COM15:	Actisense NGT]		
NB <u>F</u> ile	<u>E</u> dit <u>V</u> iew <u>W</u> ine	dow <u>H</u> elp		_ & ×
۷	🕹 🛃 Сом	15: Actisense NGT	▼ 115200	▼
E F	PC Receive Load (0%)			
SRC	Manufacturer	Device Function	Property	Value
35	Victron	Battery (170)	Source Address	35
254	Actisense	Gateway (130)	Industry Group	4
			System Instance	0
			Device Class	Electrical Generation (35)
			Device Function	Battery (170)
			Device Instance	1
			Manufacturer ID	Victren (358)
			Unique ID	0
			N2K Database Version	1.301
			N2K Certification Level	1
			Load Equiv. Number	50 mA (1)
			Manu. Product ID	1963
			Manu. Model ID	BMV
			Manu. Software ID	1.06
			Manu. Hardware ID	1.0
			Manu. Serial ID	0000000
			Installation Details 1	
			Installation Details 2	
•			Manu. Information	
H 4 F		twork View / Hardware Co		ties / Log /
СОМ 15		Transfer Receive All		
000010	and the second			

### **3.** Changing a data instance with Actisense

Changing a data instance:

- 1. Open Actisense NMEA Reader
- 2. Select data view (tab selection is at the bottom left)
- 3. Right click the PGN:

	EA Reader - e Edit V					
0	3	1		sense NGT	115200	(0%)
	PC Receive	Load (1%	6)			
ine	PGN	SRC	DST	Name		NMEA 2000 PGN: 127506 (0x1F212) Name: DC Detailed Status
	60928	35	255	ISO Address Claim		Source = 35, Destination = 255
2	127508	35	255	Battery Status		Priority = 6, Length = 9
3	127501	35	255	Binary Switch Bank Status		Number Of Fields = 7
	61184	35	255	Manu. Proprietary single-fr	ame addressed	Field 1: SID = 73
)	127500	Modify	Data Insta	DC D-t-lind Status		Field 2: DC Instance = 2
; ,		Modify Data Insta		Iormation		Field 3: DC Type = 0 (Battery) Field 4: State of Charge = 100 Percent
		35	255	Battery Status		Field 5: State of Health = Not Available Field 6: Time Remaining = 14400 Minutes Field 7: Ripple Voltage = Not Available
	N Data		Network \	/iew / Hardware Config /	,	II I I I Details Properties Log
DM 15	115200	Open	Transfer	r Receive All		

4. And change the value:

	EA Reader -	[COM15	: Actisen:	se NGT]
NR Fil	e Edit V	iew Wi	ndow H	Help
0	3 📙	СО	M15: Actis	sense NGT
	PC Receive	Load (0%	<b>)</b>	
Line	PGN	SRC	DST	Name NMEA 2000 PGN: 127506 (0x1F212) Name: DC Detailed Status
1 2	60928 127508		255 255	ISO Address Claim     Name Do Detailed Status       Battery Status     Source = 35, Destination = 255       Priority = 6, Length = 9
3 4	127501 61184	35 35	255 255	Binary Switch Bank Status     Number Of Fields = 7       Manu. Proprietary single-frame addressed     Field 1: SID = 121
5 6	127506 126996	35 35	255 255	DC Detailed Statue       Field 2: DC Instance = 2         Produc       NMEA Reader         ield 3: DC Type = 0 (Battery)
7	127508	35	255	Batter       Modify Data Instance in PGN: 127506 Add: 35         Field No.       Instance         2       2         Modify       Cancel    Instance <p< th=""></p<>
•				
K 4 ► COM 15	▶ <b>Data</b> 115200	View / Open	Network \ Transfer	/iew / Hardware Config / I( ( ) → ) Details / Properties / Log /

Notes for BMVs, Lynx Shunt and the Lynx Ion + Shunt:

- The Battery Instance and the DC Detailed instance are the same value. Changing one of them, will also change the other one.
- Since the BMV sends out two voltages, the main voltage and the aux- or starter-voltage, it comes preconfigured with two battery instances: 0 and 1. When you want to change that to 1 and 2, change the 1 into 2 first, and then the 0 into 1, as they cannot be the same.

## 4. Changing Instance Using Maretron N2KAnalyzer

Maretron understands that it is sometimes difficult to know whether a particular product uses device instance or if it uses data instance to uniquely identify itself on an NMEA 2000 network. For this reason, Maretron uses a term called "Unique Instance" where the N2KAnalyzer software tool automatically determines if a particular device uses device or data instances.

Open N2KAnalyzer and make sure that the "Unique Instance" column is turned on (i.e. checked) using the Setup>Columns menu item.

		Jpdate Director	onfigure Web V		1	Unique Instance Column											
xp.	Units	Gateway			10	Mfg Model Version		Unique Instance	Label	Current Software	Available Software	Installation Description #1	Device Instance	NMEA 2000 Version	NMEA 2000 Certification Level	LE	
~	Download	Download Software Updates on Startup Listen Only					-					-			LEVE	1	
	Listen Onl						. 11002103	2 🖲		4.000,4.001		and the state of the state of the	2	1,300	8	1	
	Recover D	evice				Rev D	327681	64		1.11	•	AC Panel Load Sh	64	1.200	B	2	
	1.5	on Startup				Rev F	131120	32		1.5	•	DC breakers 16x30	32	1.200	8	1	
×	Save Devic	e Config in Bo	utiles	-				1		V01.0.1	•		1	1.200	A	7	
C	Columns			•	)	Expand			1.	2.40	•		3	1.210	В	3	
-	-08"	CONTRACTO	fermentes	10100	4	Node Addres	s			1.0.0 SO3653	4		5	0.001	В	1	
	29	Maretron		VDR1	-	Manufacture	r		ondary Data Recor	2.0.0.4	3.0.3.1	Connected Aft Bus	1	2.000	A	4	
	CA	Maretron		DSM.	~	Mfg Model II	>		k Display	1.4.17.5	1.6.6.3		1	2.000	A	13	
	BF	Maretron		ACM	4	Mfg Model V	ersion		Bus	1.0.8.2	1.0.9.2	Main A/C Bus A	0	1.301	A	1	
	A0	Maretron		J2K10		Mfg Serial Nu	umber		Maker	1.0.13.2	1.2.1.1		0	1.301	A	3	
	9C	Maretron		SSC2	-	Gourse	12550.2	_	hary Heading Sens	5.0.3	5.0.4.1	Midship	0	1.210	A	3	
	30	Maretron		GP	4	Unique Instar	sce.			1.6.13ù	2.3.0.1	Backup 1	2	1,210	A	3	
	7C	Maretron		TLM		Laber			toard Water	1.1.6	1.1.8.3		0	1.301	в	2	
	74	Maretron		TLM		Current Softw	vare		oline Tank	1.1.6	1.1.8.3	Tender Gasoline T	0	1.301	в	2	
	86	Maretron		wso	4	Available Software			d Sensor	2.0.13	2.0.13		0	1.210	A	3	
	72 Maretron DST1		4	Installation Description #1				1.003,1.022	•	Port Sounder	0	1.300	в	4			
	71	Maretron		ALM		Installation D	escription #2	2	ine Room	1.0.6	1.0.6	Engine Room	6	1,301	A	2	
	2D	Maretron		GPS2		Mfg informat	tion		nary	3.5	3.7.1.1	Primary GPS Ante	0	1.301	A	3	
	CF	Maretron		DCM		Device Class			(power	1.0.4	1.0.5.2	System Power	2	1.210	A	1	
	73	Maretron		TLM		Device Funct	ion		Tank	1,1,6	1.1.8.3		0	1.301	в	2	
	0A	Maretron		USB1	4	Device Instan	ce			1.8,561	1.8.6.2	Connected to Hel	1	1.210	Α.	3	
	cc	Maretron		TMP		System Instar	ice.		in Temperatures	1.1.1	1.1.2.7	Ship's Inside Tem	0	1.210	A	1	
		re Channel	Sourc		~	NMEA 2000 V						and some second second		10002000	ili vi	chi	
	0		Inside Temperal	-		NMEA 2000 0		Level									
-	1		Inside Temperat			Mfg Product											
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	CE	Maretron	-	TMP1	00	1.0	1489901		Engine Room	1.1.1	1.1.2.7	Engine room Rear	0	1,210	A	-Ta	
	14	Maretron		ALMI		1.0	1460041	0	Deck Alarm	1.0.6	1.0.6	Located Above Po		1.301	A	2	
	- na	Maretron		CILATO		10	14299072		Smoke Detectors	111	1777		0	1 210	Δ	-	

Within the N2KAnalyzer main window, any cell with a white background can be edited by clicking in the cell and typing in the desired value. You can see from the following screen shot that a few parameters have a white background including Label and Installation Description #1. To change a devices instance, click in the Unique Instance cell for the device you want to change and type the new number followed by a carriage return. If the particular products accepts the instance change, you will see the new instance number reflected in the cell. You can also use a tool within N2KAnalyzer to check that all products on the network are uniquely instanced. Use the Analyze>Instancing menu to verify correct overall system instancing.

Last	
update: 2020-04-10 ve.can:changing_nmea2000	_instances https://www.victronenergy.com/live/ve.can:changing_nmea2000_instances?rev=1586469737
00:02	

	-		11/11				in N2KAnalyzer, Ven	aon 6/7/11 - 1000	sust.				- 1	ale -
			Help											
	8	Teceived PGNs												_
pand	N	Transmitted PGNs	Mfg	Mfg Model	Mfg Serial		Label	Current Software	Available Software	Installation	Device	NMEA 2000	NMEA 2000	
		Device Properties	Model ID	Version	Number	Instance				Description #1	Instance	Version	Certification Level	
	C	Instancing	-	Victoria	-		-					100000		-
	23	DSM250 Viewing	HT200	44-162-1-02,	11002103	2		4.000,4.001	•	Sea water temp	2	1.300	8	1
	2F	EEPROM Contents	AC08	Rev D	327681	64		1.11	•	AC Panel Load Sh	64	1.200	B	2
	10	Carling Technologies	DC16	Rev F	131120	32		1.5	•()	DC breakers 16x30	32	1.200	8	1
	11	Floscan instrument Co., I				1		V01.0.1	•		1	1.200	A	7
	BA	Garmin	GPS17x	1.00	3431140	3		2.40	•		3	1.210	8	3
	0B	Lowrance Electronics	EP-DDS	1.0.0	316	5		1.0.0 \$03653	• 1		5	0.001	8	1
	29	Maretron	VDR100	1.0	1760015	1	Secondary Data Recor	2.0.0.4	3.0.3.1	Connected Aft Bus	1	2.000	A	4
	CA	Maretron	DSM250	1.0	1300176	1	Deck Display	1.4.17.5	1.6.6.3		1	2.000	A	13
	BF	Maretron	ACM100	1.0	1389904	0	A/C Bus	1.0.8.2	1.0.9.2	Main A/C Bus A	0	1.301	A	1
	- AD	Maretron	J2K100	1.0	1241404	0	ICE Maker	1.0.13.2	1,2,1,1		0	1.301	A	3
	9C	Maretron	SSC200	2.0	1120707	0	Primary Heading Sens	5.0.3	5.0.4.1	Midship	0	1.210	A	3
	30	Maretron	GPS100	1.1	1140232	2	1	1.6.130	2.3.0.1	Backup 1	2	1.210	A	3
	7C	Maretron	TLM100	1.0	1500082	0	Starboard Water	1.1.6	1.1.8,3		0	1.301	8	2
	74	Maretron	TLM150	1.0	1529901	0	Gasoline Tank	1.1.6	1.1.8.3	Tender Gasoline T	0	1.301	8	2
	- 86	Maretron	W50100	2.0	1201734		Wind Sensor	2.0.13	2.0.13		0	1,210	A	3
	72	Maretron	DST110	D235-51-TS		0		1.003, 1.022	-	Port Sounder	0	1.300	8	4
	71	Maretron	ALM100	1.0	1469902	5	Engine Room	1.0.6	1.0.6	Engine Room	6	1.301	A	2
	2D	Maretron	GPS200	2.0	15266	0	Primary	3.5	3.7.1.1	Primary GPS Ante	0	1.301	A	1
	CF	Maretron	DCM100	1.0	1400046	1	N2Kpower	1.0.4	1.0.5.2	System Power	2	1.210	A	1
	73	Maretron	TLM200	1.0	1540111	2	Day Tank	1.1.5	1.1.8.3	opacini ronce	0	1.301	8	2
	0A	Maretron	USB100	1.0	1160258	1	Day Talik	1.8.5b1	1.8.6.2	Connected to Hel	1	1.210	A	3
	- CC			1.0			A 11 A	1.1.1	1.1.2.7				A	1
		Maretron	TMP100		1480009		Cabin Temperatures			Ship's Inside Tem		1.210		1
	- CE	Maretron	TMP100	1.0	1489901		Engine Room	1.1.1	1.1.2.7	Engine room Rear		1.210	A	1
	IA	Maretron	ALM100	1.0	1460041	0	Deck Alarm	1.0.6	1.0.6	Located Above Po	0	1.301	A	2
	- D4	Maretron	SIM100	1.0	1429902	2	Smoke Detectors	1.1.1	1.2.2.2	20010000000000000	0	1.210	A	2
	08	Maretron	IPG100	1.0	1620002	1	Secondary	3.6,0	4.0.7.6	Secondary Ship's		1.301	A	3
	- A3	Maretron	J2K100	1.0	1241755	0	Main Ships HVAC	1.0.13.2	1.2.1.1	Dometic Converter		1.301	A	3
	28	Maretron	VDR100	1.0	1760014	0	Primary Data Recorder	2.0.0.4	3.0.3.1	Connected Fwd Bus	0	2.000	A	4
	04	Maretron	US8100	1.0	1160253	2		1.8.3	1.8.6.2	Connected to Nav		1.210	A	3
	94	Maretron	EMS100	2.0	1220251	0	Engine Main	1.4.2.4	1.4.3.1	12AY-W 1659HP	0	1.210	A	1
	BD	Maretron	NBE100	1.0	1240263	0	Fwd Ship's NMEA200	1.0.0	1.1.0.1		0	1.301	A	3
	88	Maretron	DSM150	1.0	1930001	0	Captain's Quarters	1,4,17,5	1.6.6.3		0	2.000	A	3
	78	Maretron	SMS100	1.0	1739904	0		1.0.1.1	•		0	1.301	A	2
	15	Maretron	DSM250	2.0	1340328	2	Engine Room	3.4.14.4	1.6.6.3		2	1.301	A	1
	14	Maretron	DSM250	3.0	1329901	4	Crew Ouarters	1.4.16.5	1.6.6.3		4	2.000	A	13
	- D1	Maretron	RIM100	1.0	1459902	1	Fire Suppression Syst	1,1,3	1.2.2.2		19	1.301	A	1
	C3	Maretron	NBE100	1.0	1240360	0	Aft Ship's NMEA2000	1.0.0	1.1.0.1		0	1.301	A	3
	80	Maretron	DSM250	1.0	1309906	3	Fly_Bridge	1.4.17.5	1.6.6.3		3	2.000	A	13
	70	Maretron	TLM100	1.0	1501234	0	Bow Holding Tank	1.1.6	1.1.8.3		0	1.301	в	2
	6A	Maretron	FFM100	1.0	1679904		Main Engine	1.1.2.1	1.2.2.1	Main Engine Fuel	0	1.301	A	2
	40	Manstron	DCR100	20		n	Linkting Control	1114	1123		n	2.000	4	2

# 5. Changing the DeviceInstance from the CCGX command line

Instead of using Actisense or Maretron software, it is also possible to change the device instance from the Color Control shell. To get root access, follow these instructions: Venus OS: Root Access

Once logged into the shell, follow below instructions. Note that the example shown changes the device instance of a Skylla-i. The device instance of a VE.Can connected MultiPlus or Quattro can be changed as well. It will show as com.victronenergy.vebus.socketcan\_can0\_di0\_xxxx.

Step 1. List the devices:

```
root@ccgx:~# dbus -y
com.victronenergy.bms.socketcan_can0_di0_uc10
com.victronenergy.charger.socketcan_can0_di1_uc12983
```

It shows a Skylla-i (the charger). dil in the name means that it is currently on DeviceInstance 1.

Step 2. Change it, for example, to 4:

```
root@ccgx:~# dbus -y com.victronenergy.charger.socketcan_can0_di0_uc12983
/DeviceInstance SetValue %4
retval = 0
```

Step 3. Wait a few seconds, and double check:

```
root@ccgx:~# dbus -y
com.victronenergy.bms.socketcan_can0_di0_uc10
com.victronenergy.charger.socketcan_can0_di4_uc12983
```

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Device instance changed successful!

#### DISQUS

~~DISQUS~~

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