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	e <u>E</u> dit <u>V</u> iew <u>W</u> ind	dow <u>H</u> elp		- 8	×
۲	📀 📙 Сом:	15: Actisense NGT	▼ 115200	OMEA 2000 Bus Load (1%)	
	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	Victron (358)	
			Unique ID	0	
			N2K Database Version	1.301	Ξ
			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	000000	
			Installation Details 1		
			Installation Details 2		
			Manu. Information		
	N Data View Met	twork View / Hardware Config	Id A N N Details Proper	ties / Los /	-
COMIT				iles / Log /	_
COMIS	115200 Open 1	ranster Receive All			зđ

3. Changing a data instance with Actisense

- 1. Open Actisense NMEA Reader
- 2. Select data view (tab selection is at the bottom left)
- Right click on the PGN number. Note that this will only work on PGNs that allow changing their data instance:



4. And change the value:

	EA Reader -	[COM15	: Actisen:	se NGT]
NR File	e Edit V	iew Wi	ndow H	Help
0	3 📙	СО	M15: Actis	ense NGT
	PC Receive	Load (0%)	
Line	PGN	SRC	DST	Name NMEA 2000 PGN: 127506 (0x1F212)
1 2 3 4 5	60928 127508 127501 61184 127506	35 35 35 35 35	255 255 255 255 255	ISO Address Claim Source = 35, Destination = 255 Battery Status Priority = 6, Length = 9 Binary Switch Bank Status Number Of Fields = 7 Manu. Proprietary single-frame addressed Field 1: SID = 121 DC Datailed Status Field 2: SID = 121
6 7	127508 127508	35 35 35	255 255 255	Produc NMEA Reader Batten ield 2: DC Instance = 2 ield 3: DC Type = 0 (Battery) ield 4: State of Charge = 100 Percent
				Field No. Instance 2 2 Modify Cancel
	▶ Data	ا م	II Network \	/iew & Hardware Config /
COM 15	115200	Open	Transfer	/ Receive All

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 uses a term called "Unique Instance" where the N2KAnalyzer software tool automatically determines if a particular device uses device or data instances.

WARNING: At Victron we do not understand what and how the Maretron software works with regards to this. We advise to use another tool, not Maretron, so that you know what you are doing, ie know what instance you are changing.

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

	-				Maretron N2KAnalyzer, Version 2.4.4.1 - Maretron – 🗖 🗶										
file Se	Software	ze Update Co Update Director	onfigure Web Help	1	Unique Instance Column										
Exps	Configure Gateway Units Download Software Updates on Startun			10	Mfg Model Version	Mfg Seria Number	Unique Instance	Label	Current Software	Available Software	Installation Description #1	Device Instance	NMEA 2000 Version	NMEA 2000 Certification Level	LEI
_	Listen Or	Listen Only Recover Device			44-162-1-02	. 11002103	64		4.000,4.001	6	Sea water temp	2	1.300	8	1
	Recover				Rev D	327681			1.11	140 - C	AC Panel Load Sh	64	1.200	8	2
	Show Tis	ps on Startup			Rev F	131120	32		1.5	•	DC breakers 16x30	32	1.200	8	1
¥	Save Des	rice Config in Boy	atfiles				1		V01.0.1	•		1	1.200	A	7
C	Column	\$		1	Expand				2.40	•		3	1.210	в	3
~	-08-	CONTRACT	Electronics EP+D	5	Node Addres	s			1.0.0 \$03653	10) 10)		5	0.001	в	1
	29	Maretron vor		-	Manufacturer Mfg Model ID		ondary Data Record	2.0.0.4	3.0.3.1	Connected Aft Bus	1	2.000	A	4	
	CA Maretron DSM		DSM:	~			k Display	1.4.17.5	1.6.6.3		1	2.000	A	13	
	BF	Maretron	ACM	4	Mfg Model Version			Bus	1.0.8.2	1.0.9.2	Main A/C Bus A	0	1.301	A	1
	- A0	Mainstron 17K10			Mfg Serial No	umber		Maker	1.0.13.2	1.2.1.1		0	1.301	A	3
	90	9C Maretron SSC2			Course Unique Instance			nary Heading Sens	5.0.3	5.0.4.1	Midship	0	1.210	A	3
	30 Maretron GP		GP	~					1.6.130 2.3.0.1	Backup 1	2	1.210	A	3	
	7C	Maretron	TLM	-	Laper	2002. 		aboard Water	1.1.6	1.1.8.3		0	1.301	в	2
	74	Maretron	TLM	-	Current Soft	vare		oline Tank	1.1.6	1.1.8.3	Tender Gasoline T	0	1.301	8	2
]	86	Maretron	wso	4	Available Software		d Sensor	2.0.13	2.0.13		0	1.210	A	3	
	72	72 Maretron DST1		-	Installation Description #1				1.003.1.022		Port Sounder	0	1.300	в	4
	71	Maretron	Maretron ALM		Installation Description #2 Mfg information Device Class Device Function		ine Room	1.0.6	1.0.6	Engine Room	6	1.301	A	2	
	2D	Maretron GPS2 Maretron DCM Maretron TLM2					nary	35	3.7.1.1	Primary GPS Ante	0	1.301	A	3	
	CF						(power	1.0.4	1.0.5.2	System Power	2	1.210	A	1	
	73						Tank	1.1.6	1.1.8.3		0	1.301	в	2	
	0A	Maretron	tron USB1		Device Instance			in Temperatures	1.8.561	1.862	Connected to Hel	. 1	1.210	A	3
	- 00	CC Matetron TMP		1 State	Sustem Instance										
	Hante	vare Channel	Source		NMEA 2000 1	lession					descent second se	10	a later see	il di	-
	0		Inside Temperature		NMEA 2000 0	entification	Level								
	1	1 Inside Temperature		1.0	Min Drodort Code										
	2	2 Inside Temperature			LEN										
	1	3 Inside Temperature 4 Inside Temperature 5 User Defined #140			3 Electronics Room			_							
	4														
-	5				8 Unused										
					1.00										
}	- CE	Maretron	TMP1	00	1.0	1489901		Engine Room	1.3.4	1.1.2.7	Engine room Rear	0	1,210	A	1
	14	Maretron	ALM1	00	1.0	1460041	0	Deck Alarm	1.0.6	1.0.6	Located Above Po	0	1.301	A	2
1	- na	Matetron	SIM1	n	1.0	1420003	3	Smoke Detectors	111	1777		0	1 210	4	"
_				-						Discon	nected from NMEA 2	000 Network		NUM	1

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: 2020-05-01	ve.can:changing_nmea2000	_instances https://www.victrone	nergy.com/live/ve.can:changir	۱g_nmea2000_instance	es?rev=1588323645
11.00					

		Neceivea Publis												
qand	N	Transmitted PGNs Device Properties	Mfg Model ID	Mfg Model Version	Mfg Serial Number	Unique Instance	Label	Current Software	Available Software	Installation Description #1	Device Instance	NMEA 2000 Version	NMEA 2000 Certification Level	L
	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	в	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	4)		3	1.210	8	3
	08	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
	90	Maretron	SSC200	20	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		1.6.130	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	WSO100	2.0	1201734		Wind Sensor	2.0.13	2.0.13		0	1.210	A	3
	72	Maretron	DST110	D235-S1-TS	•	0		1.003, 1.022		Port Sounder	0	1.300	В	4
	71	Maretron	ALM100	1.0	1469902	5	Engine Room	1.0.6	1.0.6	Engine Room	б	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	3
	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	1.1,6	1.1.8.3		0	1.301	B	2
	0A	Maretron	USB100	1.0	1160258	1		1.8.5b1	1.8.6.2	Connected to Hel	1	1.210	A	3
	cc	Maretron	TMP100	1.0	1480009		Cabin Temperatures	1.1.1	1.1.2.7	Ship's Inside Tem	0	1.210	A	1
	CE	Maretron	TMP100	1.0	1489901		Engine Room	1.1.1	1.1.2.7	Engine room Rear	0	1.210	A	1
	1A.	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		0	1.210	A	2
	08	Maretron	IPG100	1.0	1620002	1	Secondary	3.6.0	4.0.7.6	Secondary Ship's	1	1.301	A	3
	A3	Maretron	J2K100	1.0	1241755	0	Main Ships HVAC	1.0.13.2	1.2.1.1	Dometic Converter	0	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	USB100	1.0	1160253	2		1.8.3	1.8.6.2	Connected to Nav	2	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	1800001	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	13
	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	8	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

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!

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