Changing NMEA2000 instances

1/7

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:	-		
NR <u>F</u> ile	<u>E</u> dit <u>V</u> iew <u>W</u> in	dow <u>H</u> elp		_ & ×
0	🕹 🖌 Сом	15: Actisense NGT	▼ 115200	▼
	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
			N2K Certification Level	1
			Load Equiv. Number	50 mA (1)
			Manu. Product ID	1963
l			Manu. Model ID	BMV
l			Manu. Software ID	1.06
			Manu. Hardware ID	1.0
			Manu. Serial ID	0000000
			Installation Details 1	
			Installation Details 2	
•	III		Manu. Information	
H 4 F	▶ \ Data View \ Ne	twork View / Hardware Con	fig I∢ ∢ → → Details \Proper	ties Log /
COM 15		Transfer Receive All		

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 Vi					
0	o 🖌	СО	M15: Actis	ense NGT 🔹	115200	
	PC Receive	Load (1%	a)			
Line 1	PGN 60928	SRC 35	DST 255	Name ISO Address Claim		NMEA 2000 PGN: 127506 (0x1F212) Name: DC Detailed Status
	127508	35	255	Battery Status		Source = 35, Destination = 255
-	127501	35	255	Binary Switch Bank Status		Priority = 6, Length = 9
I	61184	35	255	Manu. Proprietary single-fran	ne addressed	Number Of Fields = 7 Field 1: SID = 73
5	127500	15	255	DC D-4-11ad Status		Field 1: SID = 75 Field 2: DC Instance = 2
5	12	Modify I	Data Insta	nce formation		Field 3: DC Type = 0 (Battery)
	127508		255	Battery Status		Field 4: State of Charge = 100 Percent Field 5: State of Health = Not Available Field 6: Time Remaining = 14400 Minutes Field 7: Ripple Voltage = Not Available
↓ ↓	▶ Data		 Network \	/iew / Hardware Config /		• • • • Details / Properties / Log /
	115200			Receive All		

4. And change the value:

NR NM	EA Reader -	[COM15	: Actisen:	se NGT]
NR Fi	e Edit Vi	iew Wi	ndow H	Help _ B ×
0	3 📙	СО	M15: Actis	ense NGT 🔹 115200 🔹 🏟 NMEA 2000 Bus Load (1%)
	PC Receive	Load (0%)	
Line 1 2	PGN 60928 127508	SRC 35 35	DST 255 255	Name NMEA 2000 PGN: 127506 (0x1F212) ISO Address Claim Name: DC Detailed Status Battery Status Source = 35, Destination = 255
3 4	127501 61184	35 35	255 255	Binary Switch Bank Status Priority = 6, Length = 9 Manu. Proprietary single-frame addressed Number Of Fields = 7
5 6 7	127506 126996 127508	35 35 35	255 255 255	DC Detailed Statue Field 2: DC Instance = 2 Produc NMEA Reader Batter Field 3: DC Type = 0 (Battery) Field 4: State of Charge = 100 Percent
				Modify Data Instance in PGN: 127506 Add: 35 Field No. Instance 2 v 2 to 2 Modify Cancel Field No. Instance Cancel Field 7: Ripple Voltage = Not Available
•			II Naturali X	
COM 1	▶ ▶ Data 5 115200	Open	Network \ Transfer	/iew Hardware Config 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 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.

	Software Upda	ste Directory	-		Unique Instance Column											
xpi	Configure Gat Units	eway			10	Mfg Model Version	Mfg Seria Number	Unique		Current Software	Available Software	Installation Description #1	Device Instance	NMEA 2000 Version	NMEA 2000 Certification Level	LEF
~	Download Software Updates on Startup					-							5		LEVE	-
	Listen Only					44-162-1-02	11002103	2 🌒 👘		4.000,4.001		Sea water temp	2	1,300	8	1
	Recover Devic	e				Rev D	327681	64		1.11	4.	AC Panel Load Sh	64	1.200	8	2
	Show Tips on	Startup				Rev F	131120	32		1.5	•	DC breakers 16x30	32	1.200	8	1
×	Save Device C	onfig in Roa	tfiles	_				1		V01.0.1	• :		1	1.200	A	7
0	Columns					Expand				2.40	•		3	1.210	В	3
~	- 08-	LOWISICS	iernenics	LP-D	4	Node Addres	s			1.0.0 \$03653	- 1		5	0.001	B	1
	29	Maretron		VDR1	-	Manufacture	t		ondary Data Recor	2.0.0.4	3.0.3.1	Connected Aft Bus	1	2.000	A	4
	CA	Maretron		DSM.	~	Mfg Model ID)		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	J2K1C 🖌			Mfg Serial Number			Maker	1.0.13.2	1.2.1.1		0	1.301	A	3
	9C	Maretron		SSC2	-	Gourse	05013		hary Heading Sens	5.0.3	5.0.4.1	Midship	0	1.210	A	3
	30	Maretron		GPD	~	Unique Instar	ice			1.6.130	2.3.0.1	Backup 1	2	1,210	A	3
	7C	Maretron		TLM		Laper		_	thoard Water	1.1.6	1.1.8.3		0	1.301	в	2
	74	Maretron		TLMT -		A State of the second se			pline Tank	1.1.6 1.1.8.3	1.1.8.3 Tender Gasoline T	0	1.301	в	2	
	86	Maretron				Available Software			d Sensor	2.0.13	2.0.13		0	1.210	A	3
	72			4	Installation D	escription #	1	1.1	1.003,1.022	• *	Port Sounder	0	1.300	в	4	
	71	Maretron				Installation Description #2			ine Room	1.0.6	1.0.6	Engine Room	6	1.301	A	2
	2D	Maretron		GPS2		Mfg informat	2000 CO 110 O		nary	35	3.7.1.1	Primary GP5 Ante	0	1.301	A	3
	CF			DCM		Device Class			power	1.0.4	1.0.5.2	System Power	2	1.210	A	1
	73		5.5.6			Device Function			Tank	1.1.6	1.1.8.3	all and a second	0	1.301	в	2
	0A				-	Device Instan			0.000	1.8.561	1.8.6.2	Connected to Hel	i	1.210	A	3
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	D D	F Maretron DCM DC Maretron TLM DC Maretron USB C DC Maretron TMP Sy Hardware Channel Source M NN Inside Temperature NN														
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	1A	Maretron		ALMI		1.0	1460041	0	Deck Alarm	1.0.6	1.0.6	Located Above Po		1.301	A	2
	na	Manetron		CILATO		1.0	1420002	1	Smoke Detectors	111	1222		0	1.210	۵	

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	
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			Help											
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pand	Ne	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	-	National State			-							-
	23	DSM250 Viewing	HT200	44-162-1-02,	11002103	2		4.000,4.001	•	and the second second	2	1.300	8	1
	2F	EEPROM Contents	AC08	Rev D	327681	64		1.11	•	AC Panel Load Sh		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
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	08	Lowrance Electronics	EP-DDS	1.0.0	316	5		1.0.0 \$03653	•		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	20	1120707	0	Primary Heading Sens	5.0.3	5.0.4.1	Mldship	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	В	2
	74	Maretron	TLM150	1.0	1529901	0	Gasoline Tank	1,1,6	1.1.8.3	Tender Gasoline T	0	1.301	В	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	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	3
	CF	Maretron	DCM100	1.0	1400046	1	N2Kpower	3.0.4	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	8	2
	0A	Maretron	US8100	1.0	1160258	1		1.8.561	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 Tern	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	US8100	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	1900001	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	1.4.14.4	1.6.6.3		2	1.301	A	15
	14	Maretron	DSM250	3.0	1329901	4	Crew Quarters	1.4.16.5	1.6.6.3		4	2.000	A	13
	DI	Maretron	RIM100	1.0	1459902	1	Fire Suppression Syst	1.1.3	12.2.2		19	1.301	A	1
	G	Maretron	NBE100	1.0	1240360	0	Aft Ship's NMEA2000	1.0.0	1.1.0.1		0	1.301	A	1
	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	1.1.0.5	Main Engine Fuel	0	1.301	A	2
	40	Maretron	DCR100	20		0	Lighting Control	1114	1123	men Engine ruel	0	2,000	4	ţ,
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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
```

Device instance changed successful!

DISQUS

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