## Changing NMEA2000 instances

### 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. All the displays in the network need to be able to address both of them separately.

There are two types of instances: device instances and data instances. And depending on the make and model of the displays being used (Garmin, Maretron, Raymarine, etcetera), you need to change one of them or both. This page explains how to change these instances.

Both the device instance and the data instance of a product can easily be changed with both Maretron N2Kview as well as and Actisense PC software. This does require a canbus adapter for your computer.

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 a PC application

- 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

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NB <u>File Edit View Wir</u>			-
	idow <u>H</u> eip		
🔍 🔇 🔓 🕐	115: Actisense NGT	▼ 115200	OMEA 2000 Bus Load (19
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
		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	
< <u> </u>		<u> </u>	
↓ ↓ ▶ ► Data View \N	/	onfig III II I I III N \Details \Proper	ties Log
OM 15 115200 Open	Transfer Receive All		

# 3. 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). di1 in the name means that it is currently on DeviceInstance 1.

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

2024-06-02 23:34

```
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!

/DeviceInstance SetValue %4

#### 4. Changing a data instance

Changing the data instance is possible with Actisense NMEA Reader PC software, version v1.517 and later. Download the latest version from their website. Look for the setup.exe on that page. Besides the PC software you also need the interface to hook the nmea2000 network up to your PC: the Actisense NGT-1: http://www.actisense.com/products/nmea-2000/ngt1.html

We are not aware of PC software from other manufacturers that has this functionality. If you do know one, please let us know in the comments below.

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:

root@ccgx:~# dbus -y com.victronenergy.charger.socketcan\_can0\_di0\_uc12983

	A Reader -	-				
MB File	e Edit Vi		ndow F M15: Actis		115200	
Line 1 2 3 4 5 6 7	PC Receive PGN 60928 127508 127501 61184 127508 127508	SRC 35 35 35 35 35 Modify I	a) DST 255 255 255 255 255 255 255 255 255 25	Name ISO Address Claim Battery Status Binary Switch Bank Status Manu. Proprietary single-fra nce formation Battery Status	ame addressed	NMEA 2000 PGN: 127506 (0x1F212) Name: DC Detailed Status Source = 35, Destination = 255 Priority = 6, Length = 9 Number Of Fields = 7 Field 1: SID = 73 Field 2: DC Instance = 2 Field 3: DC Type = 0 (Battery) 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
<ul> <li></li> <li><!--</th--><th>▶ Data</th><th></th><th>III Network V Transfer</th><th>/iew ∠ Hardware Config / Receive All</th><th>•</th><th>H I I Details Properties Log</th></li></ul>	▶ Data		III Network V Transfer	/iew ∠ Hardware Config / Receive All	•	H I I Details Properties Log

4. And change the value:

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

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.

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

### 5. Changing Instance Using Maretron N2KAnalyzer

automatically determines if a particular device uses device or data instances.

	PC Receive		M15: Actis	ense NGT 🔹 115200	<ul> <li>NMEA 2000 Bus Load (1%)</li> </ul>
Line 1 2 3 4 5 6 7	PGN 60928 127508 127501 61184 127506 126996 127508	SRC 35 35 35 35 35 35 35 35	DST 255 255 255 255 255 255 255	Name ISO Address Claim Battery Status Binary Switch Bank Status Manu. Proprietary single-frame addresse DC Detailed Status Produc NMEA Reader Batter Modify Data Instance in PGN: 127506 Field No. Instance 2 2 10 3 Modify Cancel	Field 2: DC Instance = 2 Field 3: DC Type = 0 (Battery) Field 4: State of Charge = 100 Percent

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Setu	p Analyzi	e Update Co	onfigure Web Help	8												
-	Software L	Jpdate Directory	t=-	1		Uniqu	ie inst	ance	Column							
	Units	Gateway	es on Startun	10	Mfg Mode Version	Mfg S Num	Seria Un iber Ins	tance	Label	Current Software	Available Software	Installation Description #1	Device Instance	NMEA 2000 Version	NMEA 2000 Certification Level	u
100	Listen Onl		and on Startup		44-162-1-02	11002	103 2			4.000,4.001		Sea water temp	2	1.300	8	
	CONTRACTOR OF	Recover Device			Rev D	32768	1 64	1		1.11		AC Panel Load Sh	64	1.200	8	2
	Show Tips	on Startup			Rev F	13112	0 32	6		1.5	•	DC breakers 16x30	32	1.200	8	1
1	1.5	e Config in Boy	tfiles				1			V01.0.1	•		1	1.200	A	7
-	Columns			1	Expand				1	2.40	•		3	1.210	в	3
-	18"	CONTRACT	lectronics EP-D	5	Node Addre	55				1.0.0 \$03653	458		5	0.001	в	1
	29	Maretron	VDR1	-	Manufactur				ondary Data Recor	2.0.0.4	3.0.3.1	Connected Aft Bus	1	2.000	A	4
	CA	Maretron	DSM.	1	Mfg Model	D			k Display	1.4.17.5	1.6.6.3		1	2.000	A	13
	BF	Maretron	ACM	4	Mfg Model				Bus	1.0.8.2	1.0.9.2	Main A/C Bus A	0	1.301	A	1
	AD	Maretron	12K10		Mfg Serial Number				Maker	1.0.13.2	1.2.1.1		0	1.301	A	3
	9C	Maretron	SSC2		Geuree	80/6011		_	nary Heading Sens	5.0.3	5.0.4.1	Midship	0	1.210	A	3
	30	Maretron	GP	-	Unique Inst	ince			0	1.6.130	2.3.0.1	Backup 1	2	1,210	A	3
	7C	Maretron	TLM		Laber	_	_	_	aboard Water	1,1.6	1.1.8.3		0	1.301	в	2
	74	Maretron	TLM	1	Current Soft	ware			oline Tank	1.1.6	1.1.8.3	Tender Gasoline T	0	1.301	В	2
	86	Maretron	wso	4	Available So	ftware			d Sensor	2.0.13	2.0.13		0	1.210	A	3
	72	Maretron	DST1	4	Installation	Descriptio	n#1			1.003,1.022	• 1	Port Sounder	0	1.300	в	4
	71	Maretron	ALM	-	Installation	Descriptio	on #2		ine Room	1.0.6	1.0.6	Engine Room	6	1,301	A	2
	2D	Maretron	GP52		Mfg inform	ition			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 Fund	tion			Tank	1,1,6	1.1.8.3		0	1.301	В	2
	0A	Maretron	USB1	4	Device Insta	nce				1.8,561	1.8.6.2	Connected to Hel	1	1.210	A	3
	cc	Maretron	TMP	-	System Inst	ince			in Temperatures	1.1.1	1.1.2.7	Ship's Inside Tem	0	1.210	A	1
	Hardwa	re Channel	Source	1	<b>NMEA 2000</b>	Version										
	>		Inside Temperature	4	NMEA 2000	Certificat	ion Level	6								
	1		Inside Temperature		Mfg Produc	t Code										
	2		Inside Temperature	4	LEN											
	1		Inside Temperature	-	3	Elect	ronics Ro	0171	-							
	ŧ.		Inside Temperature		4	Mess										
	5	_	User Defined #140	_	8	Unus	ed		_							
	CE	Maretron	TMP	100	1.0	14899	01	E	ngine Room	1.1.1	1.1.2.7	Engine room Rear	0	1,210	A	1
	1A	Maretron	ALM	100	1.0	14600	41 0	D	eck Alarm	1.0.6	1.0.6	Located Above Po	0	1.301	A	2
	na	Manetron	CIBAT	m	10	14790	10 5	ç	moke Detectors	111	1777		n	1 210	۵	3

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.

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	Ana		нер											
-	-	Received PGNs	1		1				Local states			I recently and	1	-
Ind	Ne	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	
-		DSM250 Viewing	HT200	44-162-1-02	11002103	2		4.000.4.001		Sea water temp	2	1.300	8	1
	2F	EEPROM Contents	ACOS	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		1.200	8	1
	11	Floscan Instrument Co., I	DC ID	THEY F	Contractor.	1		V01.0.1		DC DEBROTS TOUDON	1	1.200	A	7
	BA	Garmin	GPS17x	1.00	3431140	3		2.40			2	1.210	B	3
	0B	Lowrance Electronics	EP-DDS	1.0.0	316	5		1.0.0 503653				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		2.000	A	4
		25				1	Contraction of the second s			Connected Art bus				
	CA	Maretron	DSM250	1.0	1300176		Deck Display	1.4.17.3	1.6.6.3	Main Art Burn		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	-
	AD	Maretron	J2K100	1.0		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	0	0	1.210	A	3
	30	Maretron	GPS100	1.1	1.	2		1.6.13ù	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	B	2
	86	Maretron	WSO100	2.0	1201734		Wind Sensor	2.0.13	2.0.13		0	1.210	A	3
1	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	1.0.4	1.0.5.2	System Power	2	1,210	A	1
1	73	Maretron	TLM200	1.0	1540111	2	Day Tank	1,1,5	1.1.8.3		0	1.301	В	2
	DA	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
	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		0	1.210	A	2
1	De l	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		1.9.3	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	6	Fwd Ship's NMEA200	1.0.0	1.1.0.1		0	1.301	A	3
	BB	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	and the second second	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	Å	13
	14	Maretron	DSM250	3.0	1329901	4	Crew Quarters	1.4.16.5	1.6.6.3		4	2.000	Å	13
	D1	Maretron	RIM100	1.0	1459902	1		1.1.3	12.2.2		 19	1.301	A	13
						0	Fire Suppression Syst				0		A	1
	C3	Maretron	NBE100	1.0	1240360		Aft Ship's NMEA2000	1.0.0	1.1.0.1		0	1.301		10.
	BO	Maretron	DSM250	1.0		3	Fly_Bridge	1.4.17.3	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
-	08	BAaretron	DCR100	20	170072	n	Linhting Control	1114	1123			2.000	4	3

### DISQUS

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