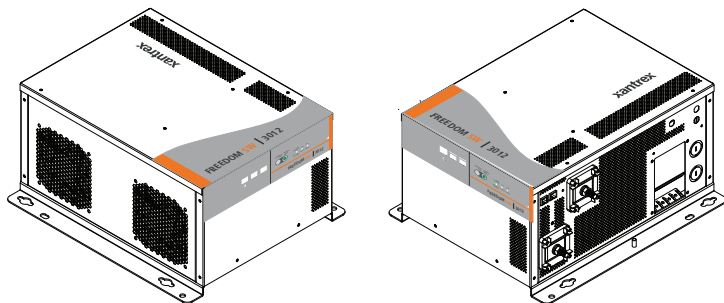


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RV-C DGN Guide

Freedom SW-RVC Inverter/Charger

Product Model Number
815-3012-02

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ABOUT THIS GUIDE

Purpose

The purpose of this RV-C DGN RV-C DGN Guide is to provide a list of supported Data Group Numbers (DGN) for the Freedom SW-RVC. The list also includes events (for example, faults and warnings), and proprietary messages.

Scope

The reference provides the DGN list including events (for example, faults and warnings), and proprietary messages available for the inverter/charger. It does not provide installation and operational information and troubleshooting guidelines.

Audience

The reference is intended for programmers of RV-C compatible devices which have to communicate with the Freedom SW-RVC Inverter/Charger.

Related Information

You can find more information about Xantrex products and services at <http://www.xantrex.com/>.

IMPORTANT: The latest RV-C standard is available at <http://www.rv-c.com/forum/8>.

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1 SUPPORTED DGNS

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Introduction

This section provides some general information on supported RV-C Data Group Numbers (DGNS) by the Freedom SW-RVC.

Bus Speed: 250kbps

Source Address: Default to 0x42, support for dynamic address claiming according to "*Section 3.3.2 Source Address Claiming*" of the RV-C standard.

DC Source DGNs

Abbreviations: HEX = hexadecimal; ms = millisecond; RV-C = Recreational Vehicle Controller Area Network (CAN)

RV-C DGN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.5.2 DC Source Status 1 DC_SOURCE_STATUS_1	500	1FFFD	Instance	See RV-C specs
			Device Priority	
			DC Voltage	
			DC Current	
6.5.3 DC Source Status 2 DC_SOURCE_STATUS_2	500	1FFFC	Instance	See RV-C specs
			Device Priority	
			Source Temperature	
			State of Charge	
			x Time Remaining	
6.5.4 DC Source Status 3 DC_SOURCE_STATUS_3	N/A (not broadcasted, responds to query)	1FFFB	Instance	Not broadcasted, just sent upon request. Sent with no data on all fields.
			Device Priority	
			x State of Health	
			x Capacity Remaining	
			x Relative Capacity	
			x AC RMS Ripple	

RV-C DGN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.5.5 DC Source Status 4 DC_SOURCE_STATUS_4	5000	1FEC9	Instance	See RV-C specs
			Device Priority	
			x Desired charge state	
			x Desired DC voltage	
			x Desired DC current	
			Battery Type	

Inverter DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.19.3 AC Output Page1 INVERTER_AC_STATUS_1	100	1FFD7	Instance Instance (See Note 1 above)	See RV-C specs
			RMS Voltage	
			RMS Current	
			Frequency	
			x Fault - open ground	
			x Fault - open neutral	
			x Fault - reverse polarity	
x Fault - ground current				
6.19.4 AC Output Page 2 INVERTER_AC_STATUS_2	N/A (not broadcasted, responds to query)	1FFD6	Instance Instance (See Note 1 above)	Not broadcasted, just sent upon request. Sent with no data on all fields.
			x Peak Voltage	
			x Peak Current	
			x Ground Current	
			x Capacity	

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
6.19.5 AC Output Page 3 INVERTER_AC_STATUS_3	100	1FFD5	x = not implemented	
			Instance Instance (See Note 1 above)	See RV-C specs
			Waveform	
			Phase Status	
			Real Power	
			Reactive Power	
			x Harmonic Distortion	
x Complementary Leg				
6.19.6 AC Output Page 4 INVERTER_AC_STATUS_4	100	1FF8F	Instance Instance (See Note 1 above)	See RV-C specs
			Voltage Fault	
			x Fault - surge protection	
			x Fault - high frequency	
			x Fault - low frequency	
			x Bypass mode active	
			Qualification Status	

Inverter DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
6.19.8 Inverter Status INVERTER_STATUS	500	1FFD4	Status	See RV-C specs
			Battery Temp. Sensor Present	
			x Load Sense Enabled	
			x Inverter Enable	
			x Pass-Through Enable	
x Generator Support Enable				
6.19.9 Inverter Command INVERTER_COMMAND	N/A	1FFD3	Instance	See RV-C specs
			Inverter Enable	
			Load Sense Enable	
			x Pass-Through Enable	
			x Generator Support Enable	
			x Reserved	
			x Inverter Enable on Startup	
			x Load Sense Enable on Startup	
			x AC Pass-Through Enable on Startup	
			x Generator support enable on startup	

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
6.19.10 Inverter Configuration Status 1 INVERTER_CONFIGURATION_ STATUS_1	On Change	1FFD2	Instance	See RV-C specs
			Load Sense Power Threshold	
			Load Sense Interval	
			DC Source Shutdown Voltage - Min	
			x Inverter Enable on Startup	
			x Load Sense Enable on Startup	
			x AC Pass-Through Enable on Startup	
			x Generator support enable on startup	
6.19.11 Inverter Configuration Status 2 INVERTER_CONFIGURATION_ STATUS_2	On Change	1FFD1	Instance	See RV-C specs
			Load Sense Power Threshold	
			DC Source Shutdown Voltage - Max	
			DC Source Warning Voltage - Min	
			DC Source Warning Voltage - Max	

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
6.19.12 Inverter Configuration Status 2 INVERTER_CONFIGURATION_STATUS_3	On Change	1FECE	Instance	See RV-C specs
			DC Source shutdown delay	
			Stack Mode	
			x DC Source Shutdown Recovery Level	
			x Generator Support Engage Current	
6.19.14 Inverter Configuration Command 1 INVERTER_CONFIGURATION_COMMAND_1	N/A	1FFD0	Instance	See RV-C specs
			Load Sense Power Threshold	25W to 250W
			Load Sense Interval	1sec to 25sec
			DC Source Shutdown Voltage (Min)	10.0V to 12.0V
6.19.15 Inverter Configuration Command 2 INVERTER_CONFIGURATION_COMMAND_2	N/A	1FFCF	Instance	See RV-C specs
			DC Source Shutdown Voltage (Max)	14.5V to 17.0V
			DC Source Warning Voltage (Min)	DC Source Shutdown Voltage (Min)" - 2.000V to "DC Source Shutdown Voltage (Min)
			DC Source Warning Voltage (Max)	DC Source Shutdown Voltage (Max)" - 3.000V to "DC Source Shutdown Voltage (Max)

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter		Freedom SW RV-C Range	
			Parameter	Freedom SW RV-C Range		
6.19.16 Inverter Configuration Command 3 INVERTER_CONFIGURATION_COMMAND_3	N/A	1FECD	x = not implemented			
				Instance	See RV-C specs	
				DC Source shutdown delay	0sec to 600sec	
				Stack Mode	1- Master 2-Slave 3-Line 2 Master	
			x	DC Source Shutdown Recovery Level	See RV-C specs	
x	Generator Support Engage Current					
6.19.18 Inverter Statistics INVERTER_STATISTIC_STATUS	N/A	1FFCE		Instance	N/A	
			x	Number of DC Under Voltage Detections		
			x	Number of Inverter AC Output Over-Loads		
			x	Number of Times Load Sense Engaged		
			x	Lowest DC Voltage		
			x	Highest DC Voltage		
			x	Lowest AC Input Voltage		
			x	Highest AC Input Voltage		
			x	Lowest AC Output Voltage		
			x	Highest AC Output Voltage		
			x	Reserved		

Inverter DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
6.19.22 Inverter DC Status INVERTER_DC_STATUS	5000	1FEE8	Instance	See RV-C specs
			DC Voltage	
			DC Amperage	
			x DC Source Shutdown Recovery Level	
6.19.23 Inverter Temperature Status INVERTER_TEMPERATURE_STATUS	500	1FEBD	Instance	See RV-C specs
			FET Temperature	
			Transformer Temperature	

Charger DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
6.20.3 AC Input Page 1 CHARGER_AC_STATUS_1	5000	1FFCA	Instance Instance (See Note 1 above)	See RV-C specs
			RMS Voltage	
			RMS Current	
			x Fault - open ground	
			x Fault - open neutral	
			x Fault - reverse polarity	
x Fault - ground current				
6.20.4 AC Input Page 2 CHARGER_AC_STATUS_2	N/A	1FFC9	Instance Instance (See Note 1 above)	N/A
			x Peak Voltage	
			x Peak Current	
			x Capacity	

Charger DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.20.5 AC Input Page 3 CHARGER_AC_STATUS_3	5000	1FFC8	Instance Instance (See Note 1 above)	See RV-C specs
			x Waveform	
			x Phase Status	
			Real Power	
			Reactive Power	
			x Harmonic Distortion	
			x Complementary Leg	
6.20.6 AC Input Page 4 CHARGER_AC_STATUS_4	5000	1FF8A	Instance Instance (See Note 1 above)	See RV-C specs
			x Voltage Fault	
			x Fault - surge protection	
			x Fault - high frequency	
			x Fault - low frequency	
			x Bypass Mode Active	
			Qualification Status	

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
6.20.8 Charger Status CHARGER_STATUS	5000	1FFC7	x = not implemented	
			Instance	See RV-C specs
			Charge Voltage	
			Charge Current	
			Charge Current Percent of Max	
			Operating State	
			Default State on Power-Up	
			Auto Recharge Enabled	
Force Charge				
6.20.10 Charger Configuration CHARGER_CONFIGURATION_ STATUS	N/A	1FFC6	Instance	See RV-C specs
			Charger Mode	
			Battery Sensor Present	
			x Charger Installation Line	
			Battery Type	
			Battery Bank Size	
			Maximum Charging Current	

Charger DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.20.11 Charger Command CHARGER_COMMAND	N/A	1FFC5	Instance	See RV-C specs
			Status	
			x Default State on Power-Up	
			Auto Recharge Enabled	
			Force Charge	0- Cancel forcing 1 - Force charge to bulk 2 - Force charge to float 14 - No change 15 - Undefined

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
6.20.12 Charger Configuration Command CHARGER_CONFIGURATION_COMMAND	N/A	1FFC5	x = not implemented	
			Instance	See RV-C specs
			Charging Algorithm	2-3-Stage 3-2-Stage
			Charger Mode	See RV-C specs
			x Battery Sensor Present	See RV-C specs
			x Charger Installation line	
			Battery Bank Size	50Ah to 2000Ah
			Battery Type	0 - Flooded 1 - Gel 2 - AGM 13 - Custom1 15 - Invalid
			x Reserved	See RV-C specs
			x Maximum Charging Current	

Charger DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
6.20.13 Charger Configuration Status 2 CHARGER_CONFIGURATION_STATUS_2	On change	1FF96	Instance	See RV-C specs
			Max Charge Current as a Percentage	
			x Charge Rate Limit as Percent of Bank Size	
			Shore Breaker Size	
			Default Battery Temperature	
			Recharge Voltage	
6.20.14 Charger Configuration Command 2 CHARGER_CONFIGURATION_COMMAND_2	N/A	1FF95	Instance	See RV-C specs
			Max Charge Current as a Percentage	10-100%
			x Charge Rate Limit as Percent of Bank Size	See RV-C specs
			Shore Breaker Size	5-30A
			Default Battery Temperature	10 - Cold 25 - Warm 40 - Hot
			Recharge Voltage	11.0V to 13.5V

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.20.15 Charger Configuration Status 3 CHARGER_CONFIGURATION_STATUS_3	On Change	1FECC	Instance	See RV-C specs
			Bulk Voltage	
			Absorption Voltage	
			Float Voltage	
			Temperature Compensation Constant	
6.20.16 Charger Configuration Command 3 CHARGER_CONFIGURATION_COMMAND_3	N/A	1FECB	Instance	See RV-C specs
			Bulk Voltage	11.2V to 16.0V
			Absorption Voltage	12.0V to 16.0V
			Float Voltage	11.0V to 16.0V
			Temperature Compensation Constant	0mV/K to 45mV/K
6.20.17 Charger Configuration Status 4 CHARGER_CONFIGURATION_STATUS_4	On Change	1FEBF	Instance	See RV-C specs
			x Bulk Time	
			Absorption Time	
			Float Time	

Charger DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
6.20.18 Charger Configuration Command 4 CHARGER_CONFIGURATION_COMMAND_4	N/A	1FEBE	Instance	See RV-C specs
			x Bulk Time	See RV-C specs
			Absorption Time	1 min to 480 min
			Float Time	1 hr to 1440 hr
6.20.20 Charger Equalization Status CHARGER_EQUALIZATION_STATUS	1000	1FF99	Instance	See RV-C specs
			Time Remaining	
			x Pre Charging Status	
6.20.22 Charger Equalization Configuration Status CHARGER_EQUALIZATION_CONFIGURATION_STATUS	On Change	1FF98	Instance	See RV-C specs
			Equalization Voltage	
			Equalization Time	
6.20.23 Equalization Configuration Command CHARGER_EQUALIZATION_CONFIGURATION_COMMAND	On Change	1FF97	Instance	See RV-C specs
			Equalization Voltage	13.5 V to 16.0 V
			Equalization Time	1 min to 360 min

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter		Freedom SW RV-C Range
			x = not implemented		
6.20.7 AC Fault Configuration Status and Command CHARGER_ACFault_CONFIGURATION_STATUS_1	On Change	1FF89		Instance (See Note 1 above)	See RV-C specs
			x	Extreme Low Voltage level	
				Low voltage level	
				High voltage level	
			x	Extreme high voltage level	
				Qualification time	
			x	Bypass mode	
6.20.7 AC Fault Configuration Status and Command CHARGER_ACFault_CONFIGURATION_STATUS_2	On Change	1FF88		Instance (See Note 1 above)	See RV-C specs
				High frequency limit	
				Low frequency limit	
6.20.7 AC Fault Configuration Status and Command CHARGER_ACFault_CONFIGURATION_COMMAND_1	N/A	1FF87		Instance (See Note 1 above)	See RV-C specs
			x	Extreme Low Voltage level	
				Low voltage level	78 V to 115 V
				High voltage level	125 V to 140 V
			x	Extreme high voltage level	See RV-C specs
				Qualification time	10s
			x	Bypass mode	See RV-C specs

Charger DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.20.7 AC Fault Configuration Status and Command CHARGER_ACFault_CONFIGURATION_COMMAND_2	N/A	1FF86	Instance (See Note 1 above)	See RV-C specs
			High frequency limit	61 Hz to 70 Hz
			Low frequency limit	44 Hz to 59 Hz

Diagnostic DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	
x = not implemented				
3.2.5 Diagnostics message Diagnostics message (DM_RV)	5000	1FECA	Operating Status - Product On	See RV-C specs
			Operating Status - Product Active	
			Operating Status - Yellow	
			Operating Status - Red	
			Product Identifier - Default Source Address	
			Suspect Parameter Number	
			Failure Mode Identifier	
			x Occurrence Count	
			x Reserved	
			x Default Source Address Extension	
x Bank Select				
3.2.8 Product identification message	On Request	1FEEB	Data	See RV-C specs

Diagnostic DGNs

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.2.1 General Purpose Reset GENERAL_RESET	N/A	17F00	Reboot	See RV-C specs
			Clear Faults	
			Reset to Default Settings	
			x Reset Statistics	
			x Test Mode	
			Reset to OEM Specific Settings	
			Reboot/Enter Bootloader Mode	
6.2.4 Instance Assignment INSTANCE_ASSIGNMENT	N/A	17C00	Device Type	See RV-C specs
			Base Instance	
			Max Instance	
			x Base Internal Address	
			x Max Internal Address	
			x Reserved	

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Parameter	Freedom SW RV-C Range
			x = not implemented	
6.2.4 Instance Assignment INSTANCE_STATUS	N/A	17B00	Device Type	See RV-C specs
			Base Instance	
			Max Instance	
			x Base Internal Address	
			x Max Internal Address	
			x Reserved	

RV-C DN Name	Broadcast List and Interval (ms)	DGN Hex	Freedom SW RV-C Range	
			Parameter	Freedom SW RV-C Range
3.3.2 Address Claimed ADDRESS_CLAIM	1000	1EE00	x = not implemented	
			Serial Number	Unit's Serial Number
			Manufacturer Code	Xantrex - 119
			Node Instance	See RV-C specs
			Function Instance	Function Instance
			x Compatibility Field	Device function - 129 INVERTER_CHARGER
			x Reserved	
			x Compatibility Field	Device class (Vehicle system for J1939) - 30 - POWER_MANAGEMENT
			x Compatibility Field	System Instance - 0
			x Compatibility Field	Industry Group - 0
Arbitrary Address Capable	See RV-C specs			

2 FAULTS AND WARNINGS

Diagnostics Message (DM_RV) in RV-C Specs 30

Diagnostics Message (DM_RV) in RV-C Specs

For a detailed description of Event numbers and troubleshooting information, refer to the Freedom SW-RVC Owner's Guide.

Abbreviations: FMI = Failure Mode Identifier; ISB = Intermediate Significant Byte; LED = light emitting diode; LSB = Least Significant Byte; MSB = Most Significant Byte; SPN = Service Point Number;

Event #	Description	SPN			FMI	LED
		MSB	ISB	LSB		
F1	AC Output under voltage	0x81	0x41	0	1	RED
F2	AC Output over voltage	0x81	0x41	0	0	RED
F17	Relays Welded/AC Backfeed	1	1	7	7	RED
F18	Relays Welded/AC Backfeed	1	1	7	7	RED
F22	Relays Welded	1	1	7	11	RED
F44	Battery Over Temperature	1	INV_CHG_INST	2	0	RED
F45	Capacitor Over Temperature Shutdown	3	INV_CHG_INST	0	0	RED
F46	Controller Error	0	0	1	11	RED
F47	DC Under Voltage (Immediate)	1	INV_CHG_INST	0	1	RED
F48	DC Under Voltage	1	INV_CHG_INST	0	1	RED
F49	DC Over Voltage	1	INV_CHG_INST	0	0	RED
F51	EEPROM SD	0	0	1	11	RED
F52	EEPROM Calibration	0	0	3	13	RED
F53	EEPROM Configuration	0	0	3	2	RED
F54	EEPROM Default	0	1	4	11	RED

Event #	Description	SPN			FMI	LED
		MSB	ISB	LSB		
F55	EEPROM Strings/Logs	0	0	4	11	RED
F56	EEPROM Strings/Logs	0	0	4	11	RED
F57	FET1 Over Temperature	2	INV_CHG_INST	0	0	RED
F58	FET2 Over Temperature	2	INV_CHG_INST	1	0	RED
F60	Internal error	0	1	4	11	RED
F61	Internal error	0	1	4	11	RED
F62	Internal error	0	1	4	11	RED
F63	Powerboard temp unreadable	2	INV_CHG_INST	2	2	RED
F64	AC Overload	0x81	0x41	1	0	RED
F66	System Cfg shutdown	0	0	3	2	RED
F67	Watchdog Error	0	1	3	11	RED
F68	Transformer over temperature	3	INV_CHG_INST	1	0	RED
F69	External Sync Failed	4	INV_CHG_INST	1	8	RED
F70	Unique Dev# Needed	0	1	2	11	RED
F71	Too Many Masters	3	INV_CHG_INST	7	11	RED
F72	Stacking System AC Assoc Mismatched	3	INV_CHG_INST	7	11	RED
F73	Transformer Temp unreadable	3	INV_CHG_INST	1	2	RED
F74	Stacking mode communication error	4	INV_CHG_INST	0	11	RED
F74	Stacking mode communication error	4	INV_CHG_INST	0	11	RED
F75	Stacking mode configuration fault	3	INV_CHG_INST	7	11	RED

Event #	Description	SPN			FMI	LED
		MSB	ISB	LSB		
F76	Stacking mode configuration fault	3	INV_CHG_INST	7	11	RED
F79	Battery Sensor short	1	INV_CHG_INST	2	2	RED
F85	Powerboard Over Temperature	2	INV_CHG_INST	2	0	RED
F87	Stacking System Inconsistent Frequencies	3	INV_CHG_INST	7	11	RED
W96	Unable to Equalize warning	3	INV_CHG_INST	4	11	YELLOW
W95	Unable to Equalize warning	3	INV_CHG_INST	4	11	YELLOW
W73	Transformer Temp unreadable	3	INV_CHG_INST	1	2	YELLOW
W79	Battery Sensor short	1	INV_CHG_INST	2	2	YELLOW
W92	Input Connected to 3-Phase AC	0x82	INV_CHG_INST	5	11	YELLOW
W44	Battery Over Temperature	1	INV_CHG_INST	2	15	YELLOW
W48	DC Under Voltage (Warning)	1	INV_CHG_INST	0	17	YELLOW
W49	DC Over Voltage	1	INV_CHG_INST	0	15	YELLOW
W57	FET1 Over Temperature	2	INV_CHG_INST	0	15	YELLOW
W58	FET1 Over Temperature	2	INV_CHG_INST	1	15	YELLOW
W68	Transformer over temperature	3	INV_CHG_INST	1	15	YELLOW
W72	Stacking System AC Out Assoc Mismatched	3	INV_CHG_INST	7	11	YELLOW
W87	Stacking System Inconsistent Frequencies	3	INV_CHG_INST	7	11	YELLOW

3 PROPRIETARY MESSAGES

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Introduction

Freedom SW-RVC has additional features which are currently not supported by standard RV-C DGNs. This section describes these proprietary messages.

Implementation of the Proprietary Messages uses the first 5 bytes of the ADDRESS_CLAIM field (described in section 3.3.3 of the RV-C Specification) of both source and destination devices to calculate the CRC (Cyclic Redundancy Check) used in the validation of the Proprietary Messages. The CRC is calculated using the the first 5 bytes of the ADDRESS_CLAIM field of the destination followed by the Proprietary Message data bytes and the first 5 bytes of the ADDRESS_CLAIM field of the source device and appended after the end of the Proprietary Message data bytes (it is not in a fixed position, its position depends on the number of bytes in the individual Proprietary Message).

See an example of calculating the CRC and creating a Proprietary Message *on page 43*.

Proprietary DGN General Framework

This message is used to request a Proprietary Message.

Abbreviation: DGN = Data Group Number; HEX = hexadecimal

Name	HEX ID	Fields	Type	Notes
PROPRIETARY_ DGN 3.2.6 Proprietary message	EF00	Message ID	uint8	
		Message Data	Variable size; up to 5 bytes.	Using this DGN the Freedom SW-RVC device multiplexes 14 different types of information in the message body.
		Message CRC	uint16	CRC-CCITT polynomial using 0xFFFF as initial value

DGN Messages

NOTE: This message is used to request a Proprietary Message.

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
PROPRIETARY_MESSAGE_REQUEST	0x2	2	teReqId	uint8	RVC_ePROP_MSG_ID_ASSOC_STS=3, RVC_ePROP_MSG_ID_DEV_MODE_STS=6, RVC_ePROP_MSG_ID_SW_VER_STS=8, RVC_ePROP_MSG_ID_GEN_SUPPORT_STS=17,
			ucParam1	uint8	
			ucParam2	uint8	
DEVICE_MODE_CONFIGURATION	0x4	4	teDesiredMode	uint8	XB_eCTRL_MODE_SAFE=2, XB_eCTRL_MODE_OPERATING=3
DEVICE_MODE_STATUS	0x6	6	teCurrentMode	uint8	XB_eCTRL_MODE_HIBERNATE=0, XB_eCTRL_MODE_POWER_SAVE=1, XB_eCTRL_MODE_SAFE = 2, XB_eCTRL_MODE_OPERATING = 3, XB_eCTRL_MODE_DIAGNOSTIC = 4, XB_eCTRL_MODE_REMOTE_POWER_OFF = 5

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
SW_VERSION_STATUS	0x8	8	Controller or Processor Instance	bit2	00b - CPU0
			Software Module Identifier	bit2	00b - Application Version 01b - XanBus Library Version 10b - RVC Version
			Software Version Msb	bit4	Version is represented as: A.BB.CC. The first digit (A) is the major number (up to 9), BB is the minor number and CC the design number resulting in a 5 decimal digit number up to 99,999.
			Software Version Isb	uint8	
			Software Version Lsb	uint8	
			Software Build Number MSB	uint8	A four digit number.
			Software Build Number LSB	uint8	

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
ASSOCIATION_CONFIG	0x01	1	teAssocType	uint8	XB_eASSN_TYPE_INVALID = 0 XB_eASSN_TYPE_DC_INPUT = 1 XB_eASSN_TYPE_DC_OUT = 2 XB_eASSN_TYPE_DC_INPUT_OUT = 3 XB_eASSN_TYPE_RESERVED = 4 XB_eASSN_TYPE_AC_INPUT = 5 XB_eASSN_TYPE_AC_OUT = 6 XB_eASSN_TYPE_AC_INPUT_OUT = 7
			ucAssocInst	uint8	0 or 1

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
			ucAssocId	uint8	XB_eAC_SRC_ID for AC_INPUT, AC_OUTPUT or AC_INPUT_OUTPUT: XB_eAC_SRC_ID_INVALID = 0, XB_eAC_SRC_ID_NONE = 1, XB_eAC_SRC_ID_ANONYMOUS = 2, XB_eAC_SRC_ID_SHORE1 = 3, . . . XB_eAC_SRC_ID_SHORE16 = 18, XB_eAC_SRC_ID_GEN1 = 19, . . . XB_eAC_SRC_ID_GEN16 = 34, XB_eAC_SRC_ID_AC1 = 35, . . . XB_eAC_SRC_ID_AC16 = 50, XB_eAC_SRC_ID_AC_LOAD1 = 51, . . . XB_eAC_SRC_ID_AC_LOAD16 = 66, XB_eAC_SRC_ID_GRID1 = 67, . . . XB_eAC_SRC_ID_GRID16 = 82, XB_eAC_SRC_ID_ALL = 252, XB_eAC_SRC_ID_RESERVED = 253, XB_eAC_SRC_ID_OUT_OF_RANGE = 254, XB_eAC_SRC_ID_DATA_NOT_AVAILABLE_DO_NOT_CHANGE = 255

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
					<p>XB_eDC_SRC_ID for DC_INPUT, DC_OUTPUT or DC_INPUT_OUTPUT:</p> <ul style="list-style-type: none">XB_eDC_SRC_ID_INVALID = 0,XB_eDC_SRC_ID_NONE = 1,XB_eDC_SRC_ID_ANONYMOUS = 2,XB_eDC_SRC_ID_HOUSE_BAT_BANK1 = 3,. . .XB_eDC_SRC_ID_HOUSE_BAT_BANK6 = 8,XB_eDC_SRC_ID_START_BAT_BANK1 = 9,. . .XB_eDC_SRC_ID_START_BAT_BANK6 = 14,XB_eDC_SRC_ID_SOLAR_ARRAY1 = 21,. . .XB_eDC_SRC_ID_SOLAR_ARRAY16 = 36,XB_eDC_SRC_ID_ALL = 252,XB_eDC_SRC_ID_RESERVED = 253,XB_eDC_SRC_ID_OUTOF_RANGE = 254,

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
ASSOCIATION_ STATUS	0x03	3	teAssocType	uint8	XB_eASSN_TYPE_INVALID = 0 XB_eASSN_TYPE_DC_INPUT = 1 XB_eASSN_TYPE_DC_OUT = 2 XB_eASSN_TYPE_DC_INPUT_OUT = 3 XB_eASSN_TYPE_RESERVED = 4 XB_eASSN_TYPE_AC_INPUT = 5 XB_eASSN_TYPE_AC_OUT = 6 XB_eASSN_TYPE_AC_INPUT_OUT = 7
			ucAssocInst	uint8	0 or 1

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
			ucAssocId	uint8	XB_eAC_SRC_ID for AC_INPUT, AC_OUTPUT or AC_INPUT_OUTPUT: XB_eAC_SRC_ID_INVALID = 0, XB_eAC_SRC_ID_NONE = 1, XB_eAC_SRC_ID_ANONYMOUS = 2, XB_eAC_SRC_ID_SHORE1 = 3, . . . XB_eAC_SRC_ID_SHORE16 = 18, XB_eAC_SRC_ID_GEN1 = 19, . . . XB_eAC_SRC_ID_GEN16 = 34, XB_eAC_SRC_ID_AC1 = 35, . . . XB_eAC_SRC_ID_AC16 = 50, XB_eAC_SRC_ID_AC_LOAD1 = 51, . . . XB_eAC_SRC_ID_AC_LOAD16 = 66, XB_eAC_SRC_ID_GRID1 = 67, . . . XB_eAC_SRC_ID_GRID16 = 82, XB_eAC_SRC_ID_ALL = 252, XB_eAC_SRC_ID_RESERVED = 253, XB_eAC_SRC_ID_OUT_OF_RANGE = 254, XB_eAC_SRC_ID_DATA_NOT_AVAILABLE_DO_NOT_CHANGE = 255

Message Name	HEX ID	DECIMAL ID	Fields	Units	Value Description
					XB_eDC_SRC_ID for DC_INPUT, DC_OUTPUT or DC_INPUT_OUTPUT: XB_eDC_SRC_ID_INVALID = 0, XB_eDC_SRC_ID_NONE = 1, XB_eDC_SRC_ID_ANONYMOUS = 2, XB_eDC_SRC_ID_HOUSE_BAT_BANK1 = 3, . . . XB_eDC_SRC_ID_HOUSE_BAT_BANK6 = 8, XB_eDC_SRC_ID_START_BAT_BANK1 = 9, . . . XB_eDC_SRC_ID_START_BAT_BANK6 = 14, XB_eDC_SRC_ID_SOLAR_ARRAY1 = 21, . . . XB_eDC_SRC_ID_SOLAR_ARRAY16 = 36, XB_eDC_SRC_ID_ALL = 252, XB_eDC_SRC_ID_RESERVED = 253, XB_eDC_SRC_ID_OUTOF_RANGE = 254,

* Not yet available at this time.

Examples of Proprietary_Message_Request

Message Name	HEX ID	DECIMAL ID	Fields	Value	Value Description
PROPRIETARY_MESSAGE_REQUEST ASSOCIATION_STATUS	0x2	2	teReqId	3	teReqId = ASSOC_STS = 3
			ucParam1	3	teAssocType = DC_INPUT_OUT = 3
			ucParam2	0	ucAssocInst = 0
PROPRIETARY_MESSAGE_REQUEST DEVICE_MODE_STATUS	0x2	2	teReqId	6	teReqId = DEV_MODE_STS = 6
			ucParam1	0	N/A
			ucParam2	0	N/A
PROPRIETARY_MESSAGE_REQUEST SW_VERSION_STATUS	0x2	2	teReqId	8	teReqId = SW_VER_STS = 8
			ucParam1	0	Controller or Processor Instance = CPU0 = 00b
			ucParam2	2	Software Module Identifier = RV-C Version = 10b

The following text box shows several examples of calculating the Cyclic Redundancy Check (CRC) for proprietary messaging using CRC16.

```
Unit #1 Address 143, Network Name: 84 12 F7 64 18 (first 5 bytes of the ISO Address Claim Message sent by
the unit with address 143=0x8F)
Unit #2 Address 67, Network Name: BB 32 E7 64 08 (first 5 bytes of the ISO Address Claim Message sent by
the unit with address 67=0x43)
//          Sender Network Name          Message Content  Destination Network Name
ASSOCIATION_REQUEST AC_IN: 02 05 00 from address 67
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x18, 0x02, 0x05, 0x00, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0xB81B
ASSOCIATION_REQUEST AC_OUT: 02 06 00 from address 67
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x18, 0x02, 0x06, 0x00, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0x6099
ASSOCIATION_REQUEST AC_IN: 02 05 00 from address 143
crc16.crc_hex( 0xBB, 0x32, 0xE7, 0x64, 0x08, 0x02, 0x05, 0x00, 0x84, 0x12, 0xF7, 0x64, 0x18 )
CRC16 = 0x25FD
```

```
ASSOCIATION_REQUEST AC_OUT: 02 06 00 from address 143
crc16.crc_hex( 0xBB, 0x32, 0xE7, 0x64, 0x08, 0x02, 0x06, 0x00, 0x84, 0x12, 0xF7, 0x64, 0x18 )
CRC16 = 0xFD7F
DEVICE_MODE_CONFIGURATION: 04 02 - Safe Mode to 14
crc16.crc_hex( 0xBB, 0x32, 0xE7, 0x64, 0x08, 0x04, 0x02, 0x84, 0x12, 0xF7, 0x64, 0x18 )
CRC16 = 0xDA28
ASSOCIATION_CONFIG AC_IN: 01 05 00 03 (XB_eAC_SRC_ID_SHORE1)
crc16.crc_hex( 0xBB, 0x32, 0xE7, 0x64, 0x08, 0x01, 0x05, 0x00, 0x03, 0x84, 0x12, 0xF7, 0x64, 0x18 )
CRC16 = 0x9426
ASSOCIATION_STATUS AC_IN: 03 05 00 03 from address 143
crc16.crc_hex( 0xBB, 0x32, 0xE7, 0x64, 0x08, 0x03, 0x05, 0x00, 0x03, 0x84, 0x12, 0xF7, 0x64, 0x18 )
CRC16 = 0x5241

ASSOCIATION_STATUS DC_IN_OUT: 03 03 00 03 - Safe Mode
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x18, 0x03, 0x03, 0x00, 0x03, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0x
DEVICE_MODE_REQUEST: 05
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x18, 0x05, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0xE639
DEVICE_MODE_STATUS: 06 03
crc16.crc_hex( 0xBB, 0x32, 0xE7, 0x64, 0x08, 0x06, 0x03, 0x84, 0x12, 0xF7, 0x64, 0x08 )
CRC16 = 0xED5A
DEVICE_MODE_CONFIGURATION: 04 02 - Safe Mode
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x10, 0x04, 0x02, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0x82B2
```

Examples of Proprietary_Message_Request

```
DEVICE_MODE_CONFIGURATION: 04 03 - Operational Mode
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x10, 0x04, 0x03, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0xC712
ASSOCIATION_CONFIG: 01 03 00 03 (XB_eDC_SRC_ID_HOUSE_BAT_BANK1)
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x10, 0x01, 0x03, 0x00, 0x03, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0x1F56
ASSOCIATION_CONFIG: 01 03 00 04 (XB_eDC_SRC_ID_HOUSE_BAT_BANK2)
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x08, 0x01, 0x03, 0x00, 0x04, 0xBB, 0x32, 0xE7, 0x64, 0x08 )
CRC16 = 0x09CA
REMOTE_PROCEDURE_CALL - Set Xanbus/RVC version - this message is not meant to be public
crc16.crc_hex( 0x84, 0x12, 0xF7, 0x64, 0x08, 0x09, 0x01, 0x09, 0xF7, 0x02, 0xAB, 0xBB, 0x32, 0xE7, 0x64,
0x08 )
CRC16 = 0xA01D
```


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