

**DB-100
DC Power Distribution Board**

Application Document

General Specifications

Input Voltage	8 VDC - 18 VDC
Input Amperage	100mA
Temperature Range	-40 - 185 Deg F (Industrial)
Environmental Limitations	Not sealed for exterior mounting.
Flash Memory (code space)	256k
EEPROM	2k (Build Option)
RAM	64k
External Dimensions	
Source Address	Dynamic, Initial 143
Default Source Address	131 (0x83) DC Load If configured, 127 (0x7F) Water Pump

Connectors

Connector Types

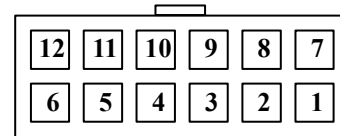
All diagrams are “wire-side” view.

Molex 12-Pin

Receptacle - Molex 5557 Series. Part #39-01-2120

Strain Relief - 41995 Series. Part #15-04-0345

Crimp-on Connectors - 5556 Series. Part #39-00-0039



Connector Pinouts

Main

4-pin Molex

Pin	Designation	Type	Notes
1	GROUND	Ground	
2	LIN	LIN	
3			
4			
5	RV-C DATA +	CAN	Attach to RV-C Bus
6	RV-C DATA -	CAN	Attach to RV-C Bus
7	POWER	12V DC Power Input	POWER
8	Serial Tx	RS-232	
9	Serial Rx	RS-232	
10	Serial Ground	Ground	
11			
12			

DGN Summary

DGN	Hex	I/O	Notes
GENERAL_RESET	0x17F40	In	Reset TM540
DM1	0xFECA	Out	Faults

DGNs Supported

General Reset

Name: GENERAL_RESET

DGN: 0x17F## (0x17F00 + source address)

Bit 1.1-1.2: Reboot unit 1 to reboot

ID Assignment

Name: PROP_DB100_ID_CONFIG
 DGN: 0xEF##
 Byte 1 Operation Always 0x1D
 Byte 2 ID 1-250.
 Bits 3.1-3.2 Group 1 Synch 0 = Slave/Local.
 1 = This unit is the master for Dimmer Group 1 on the network.
 Bits 3.3-3.4 Group 2 Synch as above.
 Bits 3.5-3.6 Group 3 Synch as above.
 Bits 3.7-3.8 Group 4 Synch as above.
 Bits 4.1-4.2 Group 5 Synch as above.
 Bits 4.3-4.4 Group 6 Synch as above.

The ID is used in the PRODUCT_ID, for initializing the source address, and in certain status DGNs. The Group Master synchronizes the group state across multiple units.

Instance Assignment

Name: PROP_DB100_DEVICE_CONFIG
 DGN: 0xEF##
 Byte 1 Operation Always 0x1F
 Byte 2 Channel 1-10. If 0xFF, the unit responds by sending all status packets.
 Byte 3 Type 0 = None
 1 = Dimmer
 2 = DC Load
 3 = Water Pump
 4 = RGB Dimmer - White
 5 = RGB Dimmer - Red
 6 = RGB Dimmer - Green
 7 = RGB Dimmer - Blue
 8 = Always On (for Circuit Protection Only.)
 Byte 4 Instance 1-250
 Byte 5-7 Device Data Per Device Type
 Dimmer: 5 = Ramp Percent. Determines ramping speed. RV-C Percent
 A value of 0 or 100% (0xC8) indicates the output is always fully on or off.
 DC Load: Not Used
 Water Pump: Not Used
 RGB: 5 = Color 1 Pct, 6 = Color 2 Pct, 7 = Color 3 Pct
 Byte 8 Reserved Do not assign.

Note that, for precise reporting of faults through the DMRV, DC Loads and DC Dimmers must not share the same Instance values.

Name: PROP_DB100_CHANNEL_CONFIG
 DGN: 0xEF##
 Byte 1 Operation Always 0x1B
 Byte 2 Channel 1-10.
 If 0xFF, the unit responds by sending all status packets.
 Bits 3.1-3.4 Slow Capacity 1-13 Amps
 Bits 3.5-3.8 Fast Capacity 1-13 Amps
 Bits 5.1-5.2 Reset Breaker 0 = Disable Channel
 1 = Reset Channel

Note that each channel has an absolute capacity of either 5 or 10 amps. The Fast and Slow capacities cannot be higher than these values.

Scene Set

Name: PROP_DB100_GROUP_CONFIG
 DGN: 0xEF##
 Byte 1 Operation Always 0x19
 Byte 2 Output 1 – 10. Must be a DC Dimmer or RGB Channel.
 If 0xFF, all DC Dimmer channels shall send their status.
 Byte 3 Group 1 0-200, 0xFC indicates not included in Group
 Byte 4 Group 2 0-200, 0xFC indicates not included in Group
 Byte 5 Group 3 0-200, 0xFC indicates not included in Group
 Byte 6 Group 4 0-200, 0xFC indicates not included in Group
 Byte 7 Group 5 0-200, 0xFC indicates not included in Group
 Byte 8 Group 6 0-200, 0xFC indicates not included in Group

DC Disconnect Command

Name: DC_DISCONNECT_COMMAND
 DGN: 0x1FECF
 Byte 1 Instance.
 Bits 2.1-2.2 Command 0 = Disconnect circuit (simulate an overcurrent)
 1 = Reset breaker.

Each channel with a defined function has Instance equal to $120 + 10 * (\text{Unit ID mod } 12) + \text{Channel} - 1$.

DC Dimmer Command 1

Name: DC_DIMMER_COMMAND_1
 DGN: 0x1FFB9
 Byte 1 Instance As configured
 Byte 2 White Level RV-C Percent.
 Byte 3 Red Level RV-C Percent.
 Byte 4 Green Level RV-C Percent.
 Byte 5 Blue Level RV-C Percent.

DC Dimmer Command 2

Name: DC_DIMMER_COMMAND_2
 DGN: 0x1FEDB
 Byte 1 Instance As configured
 Byte 2 Group bitmap: e.g. 00000000b=All, 00111101b=Group 2 only.
 Byte 3 Desired Level RV-C Percent.
 250 (0xFA) selects last non-zero value
 251 (0xFB) selects stored memory value
 Byte 4 Command See Chart
 Byte 5 Duration 0-240 Seconds.

DC Load Command

Name: DC_LOAD_COMMAND
 PGN: 0x1FFBC
 Byte 1: Instance
 Byte 3: Desired Level 0%="off", 200 = 100%

Water Pump Command

Name: WATER_PUMP_COMMAND
 PGN: 0x1FFB2
 Bit 1.1-1.2: Command 00 = Turn Off, 01 = Turn On

DGNs ReportedID Assignment

Name: PROP_DB100_ID_STATUS
 DGN: 0xEF##
 Byte 1 Operation Always 0x1C
 Byte 2 ID 1-250.

Device Status

Name: PROP_DB100_DEVICE_STATUS
 DGN: 0xEF##
 Byte 1 Operation Always 0x1E
 Byte 2 Channel 1-10
 Byte 3 Type 0 = Disabled
 1 = Dimmer
 2 = DC Load
 3 = Water Pump
 Byte 4 Instance 1-250
 Byte 5 Device Data see PROP_DB100_DEVICE_CONFIG
 Byte 8 Unit ID 1-250. From the PRODUCT_ID

Provided to simplify parsing when multiple units are installed.

The unit responds with the report for the output indicated in the command – one command message triggers one response message. If a (blank) command is sent with a Channel equal to 0xFF, all ten packets are sent.

Load Status

Name: PROP_DB100_CHANNEL_STATUS
 DGN: 0xEF##
 Byte 1 Operation Always 0x1A
 Byte 2 Channel 1-10 – Channel
 Bits 3.1-3.4 Slow Capacity 1-13 Amps
 Bits 3.5-3.8 Fast Capacity 1-13 Amps
 Byte 4 Unit ID 1-250. From the PRODUCT_ID
 Provided to simplify parsing when multiple units are installed.
 Bits 5.1-5.2 Overcurrent 0 = Ok. 1 = Disabled due to any Overcurrent
 Bits 5.3-5.4 Hard Overcurrent 0 = Ok, 1 = Disabled due to Hardware Overcurrent
 Bits 5.5-5.6 Fast Overcurrent 0 = Ok, 1 = Disabled due to Fast Software Overcurrent
 Bits 5.7-5.8 Slow Overcurrent 0 = Ok, 1 = Disabled due to Slow Software Overcurrent
 Byte 6 Temperature 0 = 0 deg C. 1 deg C/ bit. Range 0-250 Deg C
 In the HMS365, this is translated to a 1-10 scale,
 with 1 = 35C, 10 = 170C. HiTemp Cutoff is 175C.
 Bytes 7 Voltage 0 = 0 Vdc. 0.1 Vdc/bit. Range 0-25.0 Vdc.
 Bytes 8 Current 0 = 0 Adc. 0.1 A/bit. Range 0-25.0 Adc

The unit responds with the report for the output indicated in the command – one command message

triggers one response message. If a (blank) command is sent with Channel equal to zero, the summary packet is broadcast. If a (blank) command is sent with a Channel equal to 0xFF, all eleven packets are sent.

Group Set

Name: PROP_DB100_GROUP_STATUS

DGN: 0xEF##

Byte 1 Operation Always 0x18

Remainder matches PROP_DB100_GROUP_CONFIG. The unit responds with the report for the output indicated in the command – one command message triggers one response message.

DC Disconnect Status

Name: DC_DISCONNECT_STATUS

DGN: 0x1FED0

Byte 1 Instance.

Bits 2.1-2.2 Status. 0 = Disconnected due to Overcurrent. 1 = Ok.

Each channel with a defined function has Instance equal to $120 + 10 * (\text{Unit ID mod } 12) + \text{Channel} - 1$.

The DGN is sent every 50 seconds, on receiving a command or on change, unless a circuit is disconnected in which case it is broadcast every five seconds.

DC Dimmer Status 1

Name: DC_DIMMER_STATUS_1

DGN: 0x1FFBB

Byte 1 Instance As configured

Byte 2 White Level RV-C Percent.

Byte 3 Red Level RV-C Percent.

Byte 4 Green Level RV-C Percent.

Byte 5 Blue Level RV-C Percent.

DC Dimmer Status 2

Name: DC_DIMMER_STATUS_2

DGN: 0x1FFBA

Byte 1 Instance As configured

Byte 2 Current 0-250 Amps

This is sent only every five seconds, and not on every change of status.

DC Dimmer Status 3

Name: DC_DIMMER_STATUS_3

DGN: 0x1FEDA

Byte 1 Instance As configured

Byte 3 Output RV-C Percent, 0xFE = Fault (e.g. overcurrent)

Bits 4.3-4.4 Overcurrent 1 = Output disabled due to Overcurrent

Byte 6 Last Command See Chart

Bits 7.3-7.4 Load Status
0 = Off
1 = On
2 = Fault

DC Load Status

Name: DC_LOAD_STATUS

PGN: 0x1FFBD
 Byte 1: Instance
 Byte 3: Operating Status 0 = Off, 200 = On, 0xFE = Fault (e.g. overcurrent)
 Bits 4.1-4.2: Operating Mode Always 1 = Manual
 Bits 4.3-4.4: Variable Level Always 1 = Variable Level Capable
 Bytes 7-8: Current RV-C Amps (0 = -1600A, 1=0.05A, 0x7D00 = 0A)
 Always non-negative.

This DGN is broadcast for DC Loads as configured in the DEVICE_CONFIG DGN

Water Pump Status

Name: WATER_PUMP_STATUS
 PGN: 0x1FFB3
 Bit 1.1-1.2: Op Status 00 = Off, 01 = On (Standby or Running), 10 = Fault

Diagnostic Message

Name: DMRV
 DGN: 0x1FECA
 Broadcast: 1 second
 Bit 1.1-1.2: Product Status 0 = Off, 1 = On
 Bit 1.3-1.4: Product Status 0 = Standby, 1 = Active
 Bit 1.5-1.6: Yellow Lamp Status 0 = Off, 1 = On
 Bit 1.7-1.8: Red Lamp Status 0 = Off, 1 = On
 Byte 2: Product Identifier
 Byte 3: Suspect Parameter Number (MSB) See SPN table below
 Byte 4: Suspect Parameter Number (ISB)
 Bits 5.1-5.5: Failure Mode Identifier (FMI)
 Bits 5.6-5.8: Suspect Parameter Number (least significant bits)
 Byte 6: Reserved Always 0xFF

Suspect Parameters

The DSA varies with the function.

Fault Description	DSA	SPN	FMI	Notes
Red Water Pump Overcurrent	127	261	6	
Red DC Load Overcurrent	131	1-INST-0	6	

Command Set (Dimmers and RGB Dimmers)

Command	Description
0x00 – Set Brightness	Set Dimmer brightness directly to the ‘desired level’
0x04 – Stop	Toggles whether the next Ramp Up/Down command will ramp up or down. If a Ramp Up or Ramp Down command is active, it stops the ramping and sets the next Up/Down command to the opposite value. Standard Dimmers Only.
0x05 – Toggle	Toggle brightness between 0% and ‘desired value’. If desired value is 0xFF,

	sets to last level.
0x13 – Ramp Up	Ramp brightness up from current brightness <i>continuously</i> until either at 100% or a 'Stop' is received. Standard Dimmers Only.
0x14 – Ramp Down	Ramp brightness down from current brightness <i>continuously</i> until either lowest brightness is reached or a 'Stop' is received. Standard Dimmers Only.
0x15 – Ramp Up/Down	Increment or decrement brightness. The direction toggles with each Stop command, a Ramp Up or Down command, or reaching 0 or 100%. Standard Dimmers Only.
0xF9 - Group Select	Sets all outputs configured for the Group(s) indicated in the group field to their Group values.
0xF8 - Group Toggle	Adjusts all outputs for the indicated Group(s), or turns them all off, alternately. Should only be used with one group at a time.
0xF7 - Group Off	Sets all outputs for the indicated Group(s) to zero.
0xF6 - Group Store	Saves the current values for every output in the indicated Group(s). Subsequent Select or Toggle commands will use the new values. Should only be used with one group at a time.
0xFA – Group Synchron Toggle On	Synchs all units in group so that the next Group Toggle will act as a Select. If the unit is a Group Master, this or 0xFB is transmitted by the DC100 after every command for the group.
0xFB – Group Synchron Toggle Off	Synchs all units in group so that the next Group Toggle will act as a Off. If the unit is a Group Master, this or 0xFA is transmitted by the DC100 after every command for the group.
0xE0 – RGB Next Color	RGB Circuits Only. Advances RGB to next color. Note that color 0 is always Off.
0xE1 – RGB Store Color 1	RGB Circuits Only. Stores current RGB value as color 1.
0xE2 – RGB Store Color 2	RGB Circuits Only. Stores current RGB value as color 2.
0xE3 – RGB Store Color 3	RGB Circuits Only. Stores current RGB value as color 3.
0xE8 – RGB Select Off	RGB Circuits Only. Turns circuit off and resets color selection sequence.
0xE9 – RGB Select 1	RGB Circuits Only. Set to RGB color 1.
0xEA – RGB Select 1	RGB Circuits Only. Set to RGB color 2.
0xEB – RGB Select 1	RGB Circuits Only. Set to RGB color 3.
0xFF – Set Brightness	Set Dimmer brightness directly to the 'desired level'

Typical Applications

Water Pump, Generic DC Load

Single Click toggles value.

Status LED: White = On, Blue = Off, Red = Fault

Dimmer

Single Click toggles On/Last Level (no ramping)

Hold to Ramp Up/Down.

Status LED: White = On, Blue = Off, Red = Fault