J1939 CAN BUS PROTOCOL : DUAL MUX MOTOR CONTROLS

Dual Motor Controller 1 Parameter Group Label	Position	SPN length	Name	Description
Local Control Switch Inputs	1.1	2	Open Motor A Control Switch Input	The state of the hardwired local control switches:
Local Control Switch Inputs	1.5	2	Open Motor B Control Switch Input	
Local Control Switch Inputs	1.7	2	Close Motor B Control Switch Input	
Limit Switch Inputs	2.1	2	Open Motor A Limit Switch Input	00 - Input is off
Limit Switch Inputs	2.3	2	Closed Motor A Limit Switch Input	01 - Input is on
Limit Switch Inputs	2.5	2	Open Motor B Limit Switch Input	10 - Not Used
Limit Switch Inputs	2.7	1	Closed Motor B Limit Switch Input	11 - Error Indicator
Indicators	3.1	2	Motor A Open	
Indicators	3.2	2	Motor A Full Closed	
Indicators	3.3	2	Motor A Full Open	
Indicators	3.4,5,6	2	not used	
Indicators	3.7	2	Motor A Locked	
Indicators	4.1	2	Motor B Open	0 - indicator off, 1- indicator on
Indicators	4.2	2	Motor B Full Closed	
Indicators	4.3	2	Motor B Full Open	
Indicators	4.4,5,6	2	not used	
Indicators	4.7	2	Motor B Locked	
Status	5.1	1	Motor A Status	Motor A + relay output
Status	5.2	1	Motor A Status	Motor A - relay output
Status	5.3	1	Motor B Status	Motor B + relay output
Status	5.4	1	Motor B Status	Motor B - relay output
Status	5.5	1	Motor A Status	Motor A LED state
Status	5.6	1	Motor B Status	Motor A LED state
Status	5.7	1	Motor System Status	System LED state
Status	5.8	1	not used	not used
Status	6	8	Motor A Current	Motor Current A in 0.1A resolution.
Status	7	8	Motor B Current	see above *
Status	8	8	Message Counter	Increments on each CAN message

Parameter Group Number 65392   **Transmission Rate** 100 ms   **Default System Address** 140

MOTOR CONTROL ACCESSORIES

Description	Part Number
Power Cable	4000648-nn [(1)]
Control Switch to Switch Bank Cable	4000655-nn [(1)]
Cab Switch to Switch Bank Cable	4000656-nn [(1)]
Motor Cable	4000651-nn [(1)]
Limit Switch Cable	4000650-nn [(1)]
CAN Bus Cable – ECU to Network	4000652-nn [(1)]
CAN Bus Cable – Network Jumper	4000653-nn [(1)]
CAN Bus Y-Connector	4008119
CAN Bus Terminator	4008120

[(1)] nn is length in feet

6.75
3.50
4.75
7.30

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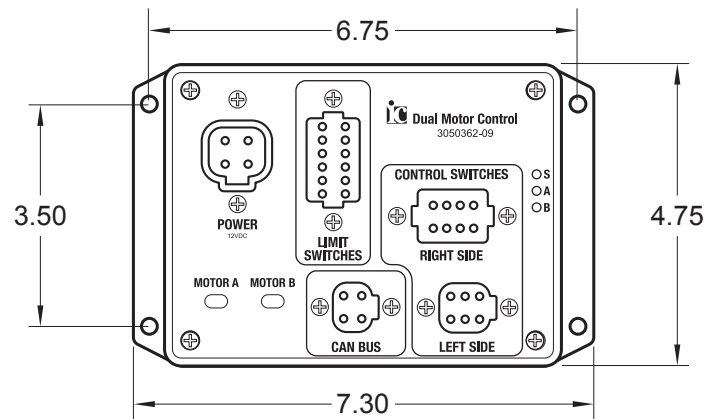
ic
3050362 Series Motor Control Modules
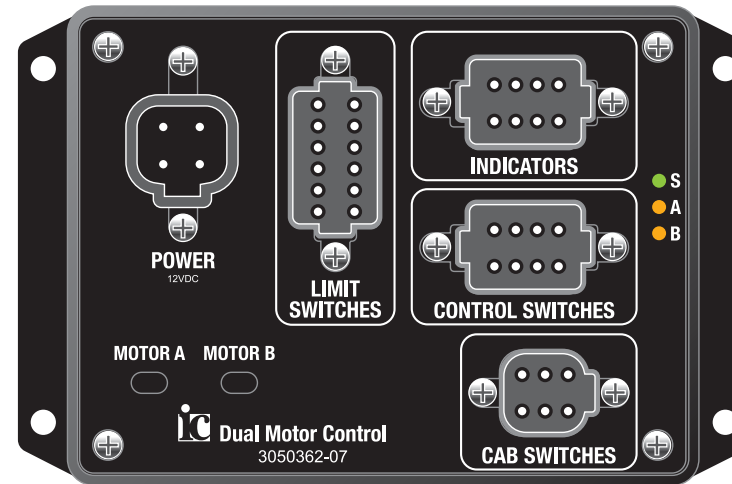
DUMP VALVE AND LADDER RACK MOTOR CONTROL DELIVERED IN A SMART DESIGN

The Innovative Controls Inc. Motor Control Modules are used to operate unidirectional or bidirectional 12VDC motors and linear actuators commonly used for dump valve and ladder rack systems. These motor controls can be remotely-operated via the J1939 CAN Bus interface, hardwired switches, or relay inputs.

Clockwise and counter-clockwise limit switch and lock inputs are used to prevent the motor from driving in a particular direction. These inputs also interlock the motor to prevent it from operating when not in demand. Multiple IC Motor Controls can be networked together using J1939 CAN protocol and controlled remotely from the cab.

IC Motor Controls are ideal for fire apparatus dump valve and chute control, or ladder rack lift applications. Innovative Controls Inc can provide ready to install, out of the box dump valve control system solutions by mating the motor controls with our exterior switch bank modules, cab switch banks, and I/O multiplexer.

The IC Motor Controls allow fire apparatus builders to offer custom dump valve system controls while reducing design, labor, and installation time.

FEATURES

- **25A Continuous / 50A Surge Motor Current**
- **Unidirectional or Bi-Directional Operation**
- **Hardwired Control Inputs**
- **Hardwired Indicator Outputs**
- **J1939 CAN Bus Operation**
- **Clockwise and Counter-Clockwise Limit Switch Inputs**
- **Lock Inputs to Prevent Operation in either Direction**
- **Electronic Overcurrent Sensing and Protection**
- **Front Panel Status LEDs**
- **-40C to +105C (-40F to +220F) AEC-Q100 Level 2 Operating Temperature**
- **No Configuration Jumpers**
- **Potted Module for Dust and Water Ingress Protection**

MODELS

| Description	Motor Channels	CAN Bus Interface	Cab Switch Interface	Indicator Interface	Part Number
Single Channel Motor Control	1	No	No	No	3050362-01
Single Channel Motor Control	1	No	Yes	No	3050362-02
Single Channel Motor Control	1	No	Yes	Yes	3050362-03
Single Channel Motor Control	1	Yes	No	No	3050362-04
Dual Channel Motor Control	2	No	No	No	3050362-05
Dual Channel Motor Control	2	No	Yes	No	3050362-06
Dual Channel Motor Control	2	No	Yes	Yes	3050362-07
Dual Channel Motor Control	2	Yes	No	No	3050362-08
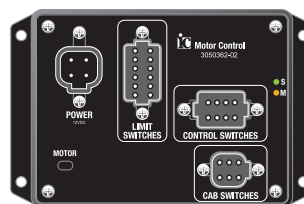
3050362-02
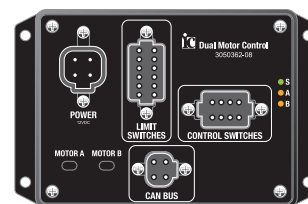Controls one motor. Includes cab switch. Other single motor modules not shown.
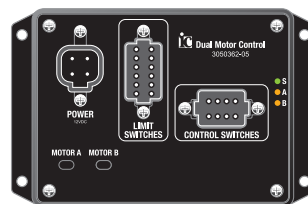
3050362-05
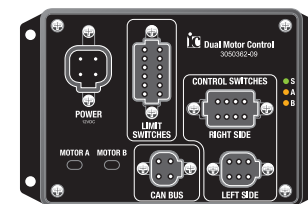Controls two motors. Used when only one set of switches is required.
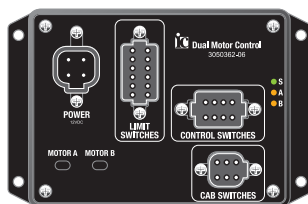
3050362-06
Controls two motors. Used when cab switches are required.
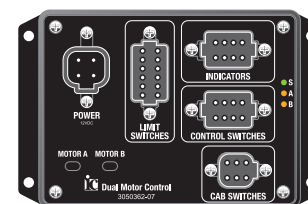
3050362-07
Controls two motors. Used when both rear body and cab switches with light indicators are required.

3050362-08
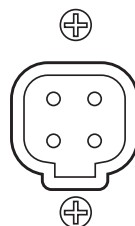Dual MUX DC Motor Control with CAN BUS. Each Module will control up to two motors.

3050362-09
Dual MUX DC Motor Control with CAN BUS Used when redundant rear body switches are required.

ELECTRICAL CONNECTIONS

POWER — Deutsch DTP15-4P Connector

Terminal	Description
1	Motor A +12VDC Power
2	Motor A Ground
3	Motor B Ground
4	Motor B +12VDC Power

Mating connector is Deutsch DTP06-4S with WP-4S wedgelock and 0462-210-1231 sockets

Motor A & Motor B — Delphi 15300027 Weather Pack Connector

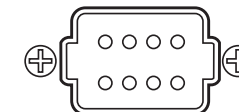| Terminal	Description
Motor A – Pin A	Motor A – Positive Lead [1]
Motor A – Pin B	Motor A – Negative Lead
Motor B – Pin A	Motor B – Positive Lead
Motor B – Pin B	Motor B – Negative Lead
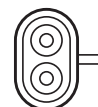
Mating connector is Delphi Weather Pack Connector 12015792 with 15324981 Cable Seal and 12124581 sockets

[1] Motor polarity may need reversed to be compatible with motor direction of rotation and limit switch operation.

CONTROL SWITCH INPUTS — Deutsch DTP15-08PA Connector

Terminal	Description	Function
1	Close Motor A	Control input causes Motor A to close. Active with +12VDC system power.
2	Open Motor A	Control input causes Motor A to open. Active with +12VDC system power.
3	Close Motor B	Control input causes Motor B to close. Active with +12VDC system power.
4	Open Motor B	Control input causes Motor B to open. Active with +12VDC system power.
5	Backlight +12VDC	+12VDC power for switch panel backlight, 800mA maximum
6	Motor A Switch +12VDC	+12VDC system power for Motor A control switch
7	Motor B Switch +12VDC	+12VDC system power for Motor B control switch
8	Backlight Ground	Ground for switch panel backlight

Mating connector is Deutsch DTP06-08SA with W8S wedgelock and 0462-201-16141 sockets

CAB SWITCH INPUTS — Deutsch DTP15-6P Connector

Terminal	Description	Function
1	Close Motor A	Control input causes Motor A to close. Active with +12VDC system power.
2	Open Motor A	Control input causes Motor A to open. Active with +12VDC system power.
3	Close Motor B	Control input causes Motor B to close. Active with +12VDC system power.
4	Open Motor B	Control input causes Motor B to open. Active with +12VDC system power.
5	Backlight +12VDC	+12VDC power for switch panel backlight, 800mA maximum
6	Backlight Ground	Ground for switch panel backlight
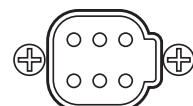
Mating connector is Deutsch DTP06-6S with W6S wedgelock and 0462-201-16141 sockets

LIMIT SWITCH INPUTS — Deutsch DTP15-12PA Connector

Terminal	Description	Function
1	Motor A Open Limit	Motor A open limit switch input. Active with +12VDC system power.
2	Motor A Closed Limit	Motor A closed limit switch input. Active with +12VDC system power.
3	Ground	System Ground
4	Motor B Open Limit	Motor B open limit switch input. Active with +12VDC system power.
5	Motor B Closed Limit	Motor B closed limit switch input. Active with +12VDC system power.
6	Ground	System Ground
7	Lock B	Lock Motor B input stops motor B. Active with +12VDC system power.
8	+12VDC	+12VDC power for limit switch, 800mA maximum
9	+12VDC	+12VDC power for limit switch, 800mA maximum
10	Lock A	Lock Motor A input stops motor A. Active with +12VDC system power.
11	+12VDC	+12VDC power for limit switch, 800mA maximum
12	+12VDC	+12VDC power for limit switch, 800mA maximum

Mating connector is Deutsch DTP06-12SA with W12S wedgelock and 0462-201-16141 sockets

INDICATOR OUTPUTS — Deutsch DTP15-08PB connector

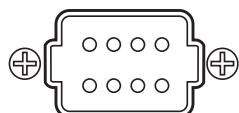| Terminal	Description	Function
1	Motor A Open	Outputs +12VDC[1] when Motor A is neither fully open nor fully closed
2	Motor A Fully Open	Outputs +12VDC when Motor A is fully open
3	Motor B Open	Outputs +12VDC when Motor B is neither fully open nor fully closed
4	Motor B Fully Open	Outputs +12VDC when Motor B is fully open
5	Ground	System Ground
6	Motor B Fully Closed	Outputs +12VDC when Motor B is fully closed
7	Ground	System Ground
8	Motor A Fully Closed	Outputs +12VDC when Motor B is fully closed

Mating connector is Deutsch DTP06-08SB with W8S wedgelock and 0462-201-16141 sockets

[1] The sum of all of the indicator outputs cannot exceed 800mA
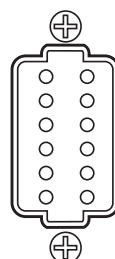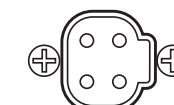
CAN BUS INTERFACE — Deutsch DTP15-4P Connector

Terminal	Description	Function
1	CAN Hi	Control input causes Motor A to close. Active with +12VDC system power.
2	CAN Lo	Control input causes Motor A to open. Active with +12VDC system power.
3	CAN Shield	CAN cable shield for J1939-11 network requirements
4	Ground	System Ground

Mating connector is Deutsch DTP06-4S with W4S wedgelock and 0462-201-16141 sockets

TECHNICAL SPECIFICATIONS

Operating Voltage	7 to 32 VDC
Power Consumption with no loads at 13.8 VDC	45 mA
Motor Current	25A continuous, 35A for 2 minutes, 50A for 20 seconds
Operating Temperature Range	-40°C to +105°C (-40°F to +220°F)
Storage Temperature Range	-40°C to +105°C (-40°F to +220°F)
Ingress Protection	IP67
Electrical Protection	Reverse voltage polarity protection on all connections
	Internal thermal fuses
	CAN Bus protected to 24V
	ESD protected to J1113-13 specifications
	Transient voltage protected to J1113-11 and J1113-42
	Indicator outputs are protected from reverse polarity, over-current, over-voltage, and voltage transients
	Input circuits are protected from reverse polarity, over-current, over-voltage, and voltage transients
	Watchdog timer supervises proper execution of software
SAE J1939 Protocol	CAN 2.0B port operating at 250kbps,
	J1939-11 or J1939-15 physical layer
	Control commands received from PGN 65408 (0xFF80)
	Status sent by PGN 65392-65397 (0xFF70-0xFF75) source address dependent
	Source address range 140-145 (0x8C-0x91)
Indicator Output Current Max	High side polarity 1A
Dimensions	6.13" wide x 4.62" high x 1.25" deep
Weight	771 grams (1.7 pounds)