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## Merlin Installation Instructions

The Merlin system is composed of an ISP, at least one DPC unit and the connecting Merlin harnesses for communication. Below is a list of items that are included with each module when ordered.

### ISP

The ISP kit includes a special "T" harness and one Termination End. The special "T" is only to be used with the ISP module.

### DPC8

The DPC8 kit includes one standard "T" harness.

### DPC4

The DPC4 kit includes one standard "T" harness.

### Extension Harness

Extension Harness length is determined at the time of purchase. One Extension harness will be required for each DPC unit in the system.

### HHP

The HHP kit will include one USB cable for connecting a PC and one five foot extension harness.

## Placement of Modules

### Intelligent Switch Panel (ISP)

The ISP is the user interface of the Merlin system, so location needs to be well thought out. Locate the ISP in a position where the driver can easily reach the control buttons and see the LCD display.

### Digital Power Center (DPC8/DPC4)

The DPC modules should be located in an area of the vehicle where minimal wiring is needed to control the desired loads. This location can be any distance from the ISP. Make sure the Extension Harnesses ordered are the appropriate length to accommodate the location of the DPC units.

## Merlin Network Connections

Once locations have been determined for all the modules in the Merlin system the communication harnesses can be installed. The ISP will require the special "T" to be plugged into the Merlin connector located on the back of the ISP. The Merlin connector is a black 6-pin



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connector located at the bottom of the ISP. The special "T" has color coated ends to help identify the assembly procedure.

**Yellow** – connect to ISP

**Red** – connect to the extension cable to the ISP/Gateway, or an ISP/non Gateway harness

**Green** – connect to DPC units through an extension harness

**Blue** – used to connect to an HHP for condition set programming

After the ISP has been placed and the special "T" harness has been connected, an extension harness can be plugged into the green side of the special "T" harness. The extension harness is ordered from InterMotive in user defined lengths to fit the Merlin component layout inside the vehicle.

The extension harness should be routed to the first DPC unit in the Merlin network. The DPC kit comes with a standard "T" harness that should be attached to the Merlin connector located at the bottom of the DPC unit. The Merlin connector is the only black 6-pin connector on the bottom of the DPC unit. After the standard "T" is connected to the DPC unit, the available end of the extension harness should be plugged into either of the available ends of the standard "T". If this is the last DPC unit in the Merlin system the last available port on the standard "T" should have a termination unit attached. If there are more DPC units in the system then an extension harness should be connected to the available port on the standard "T" from the last DPC unit and run to the next standard "T" of the second DPC unit in the Merlin system. In any case, once the last module has been placed in the Merlin network there will be an available port on the standard "T" where a termination unit should be placed.

The last step for Merlin network installation is to apply power. The red leg of the special "T" connected to the ISP will provide power to the rest of the Merlin network. The application of power can be done in one of two ways. If there is a Gateway installed in the vehicle, an ISP to Gateway connection harness should be used to make the connection from the red side of the special "T" to the Gateway. Not only will this supply the power to the Merlin network, but it also supplies vehicle information to the ISP for any condition set used by the Merlin system. If there is not a Gateway installed in the vehicle a non Gateway harness will be connected to the red side of the special "T". The blunt cut wires will then be connected to the vehicle battery and ground. It is important the power supplied to the Merlin network does not turn off with ignition. Merlin has built in timers to power down the system when the condition set is defined to do so. Prematurely powering down the Merlin network may not give the desired results for the condition set.

Once the Merlin network has been connected and the modules are setup, a green LED will illuminate on all DPC units in the system and the ISP will start with the current condition set loaded into the onboard memory. If the desired condition set is not already installed on the ISP, now would be the appropriate time to download the condition set from a HHP. This can be done by using the five foot Merlin extension provided with the HHP kit and plugging into the last remaining (blue) port on the special "T" harness. Once connected with the blue portion of the special "T", harness press and hold the black button on the HHP. Once the Tx/Rx LED begins to flash the button can be released. The ISP will reset once the condition set is done loading, and the ISP will restart. The HHP and extension harness can be removed from the system after the ISP restarts.

If a DPC module is incorrectly connected and has been set up in the current configuration file, the ISP will deliver a communication warning during initialization. The communication warning will continue until any button is pushed on the ISP to bypass the current module and move on to the next module in the system. To verify the installed units are recognized by the ISP hold the InterMotive button for three seconds after initialization is complete and view the list of



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“Detected Modules” in the diagnostic menu. If the installed modules are not recognized check the termination end to make sure it is in place and the harnesses are installed correctly. If this does not fix the recognition problem, check the DPC module identification. For module identification information, refer to the operator’s manual.

#### High Current terminals and Ignition

Each DPC unit requires a heavy gauge wire run from the vehicle battery to the positive and negative terminals at the top of the unit. The terminals studs on the DPC units use a 7/16” nut and bolt. It is preferred to connect the power cables with eyelets to the DPC power stud to ensure solid connection. The gauge of wire used for power distribution will depend on the amount of current the DPC unit will supply to the loads in the bus. Check the ANSI standard for current ratings for various wire gauges.

The ISP requires an ignition signal for normal operation. This will wake up the system and allow the system to go to sleep when the key is turned on or off. The ignition signal needs to be a 12 Volt signal sent to pin-10 of the 10-pin connector on the back of the ISP and represents the state of the ignition of the vehicle. Without this connection, the Merlin system will only remain awake for 59 minutes unless otherwise defined.

#### Output Connections

At this point in the installation, the condition set should be complete or at least well outlined so that it is understood where each input and output is to be run in the vehicle.

It is desirable to have all loads controlled by the DPC units to have their grounds returned back to the DPC unit itself instead of using the chassis ground. This is done to eliminate any potential grounding issues in the system. Each output has its own ground designated in the connector of the DPC unit.

Each of the Low Current Outputs (LCO) on the DPC units do not have independent ground return pins, so these will require a chassis ground - these outputs are the only exception to the output grounding rule for the DPC units.

#### Input Connections

The ISP and DPC units have inputs that require a positive 12 volt signal for an active high state.

The ISP and DPC units also have ground inputs that give an active state when a ground signal is present. To ensure that the digital inputs give the appropriate readings, make sure the ground wire for the input switch (or other devices) is making good contact with the chassis or run to a common system ground. This can be checked in the diagnostic menu of the ISP once the input wire has been run to the desired digital input connector. For a list of pin outs of the digital inputs refer to the Merlin operator’s manual.