



Merlin Installation Instructions

Special Note: It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

These instructions apply to Merlin systems which use a single piece communication harness between the Gateway/MIM, ISP, and DPC modules. Systems using the segmented harness system should use instructions specific to that wiring system.

The Merlin kit will include:

ISP - The Intelligent Switch Panel (ISP) is the control center of the InterMotive Merlin Multiplex System[®]. The ISP controls turning on/off loads and displays system status.

DPC8 - The Digital Power Center 8 (DPC8) drives 8 high current outputs and four low current outputs. It also provides general purpose inputs for the Merlin system. The DPC8 communicates with the ISP via a multiplexed CAN communication bus. It receives commands from the ISP to turn on/off loads and responds with load and input status.

DPC4 - The Digital Power Center 4 (DPC4) drives 4 high current outputs and four low current outputs. It also provides general purpose inputs for the Merlin system. The DPC4 also communicates with the ISP via a multiplexed CAN communication bus. It receives commands from the ISP to turn on/off loads and responds with load and input status. It can be configured to control an electric motor reversing door system or be used as general purpose load controller.

The Hand Held Programmer kit will include:

HHP - The Hand Held Programmer (HHP) is a device used to transfer Merlin configuration information from your PC to the ISP. Once loaded from a PC via a USB port, the HHP can be used to configure any number of ISP's. Merlin configuration data is created using PC software called the Merlin Option Wizard. The HHP kit includes one USB cable for connecting to a PC.

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 can be located to minimize the distance to the loads being controlled. This minimizes the length of large copper wire runs. The distance from the DPC module to the ISP is not critical and the Merlin multiplex harness can be ordered to any custom length desired. Locate the modules in an area free from moisture intrusion and external heat sources.

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Merlin Network Connections

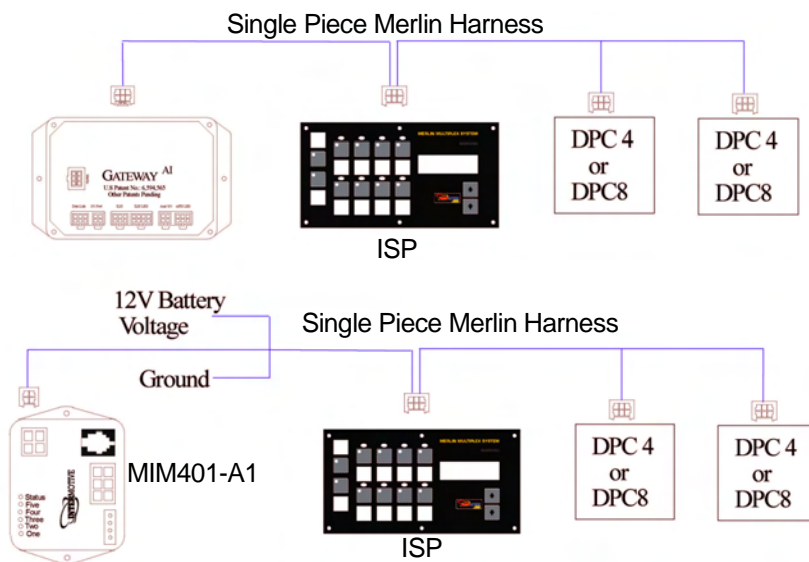
Once the locations have been determined for all the modules in the Merlin system, the communication harness can be installed. The Merlin system relies on vehicle data it receives from the Gateway module or Merlin Interface Module (MIM or MIM401-A). The single piece Merlin communication harness should have an appropriate connector on one end to interface with either a Gateway module or MIM, depending on your system. The various connectors on this single piece harness are labeled appropriately for connection to Gateway/MIM, ISP, and DPC(s).

With the exception of the MIM connector (if applicable), all connectors are 6 pin Black, and should mate with a corresponding black connector on the ISP and DPC's. It does not matter which DPC is plugged into the DPC connectors on the harness. The ISP however, **MUST** be plugged into the connector labeled ISP.

- For systems using a GTWY401-A1, the Merlin logic sections will be powered through the Gateway module. Plug the Black 6 pin connector of the Merlin harness, labeled "to Gateway" into the corresponding Black connector on Gateway marked "Merlin".
- For systems using the MIM401-A, there are Red and Black flying leads provided for Merlin (logic) power. The Red and Black flying leads should be connected to fused (4A) Vbat (hot at all times) and ground, respectively. A white 4 pin connector on the Merlin single piece harness (labeled to MIM) should be plugged into the matching connector on the MIM401-A module.

It is important that the power supplied to the Merlin network does not turn off with ignition. Merlin has built in timers to power down the system as controlled by the Merlin condition set in the ISP. Prematurely powering down the Merlin network may not give the desired results.

Connect each component to the harness in the location shown.





Once the Merlin network has been harnessed together and modules are set up, the power and ground can be applied.

NOTE: before applying power, make sure no load connections are plugged in as you will want to do some checks prior to having loads powered.

After (logic) power is applied, a green LED will be illuminated on the DPC units in the system while the ISP is awake. The ISP will illuminate the LCD screen when it is awake and functioning. If the desired condition set is not already installed on the ISP, now would be the appropriate time to download the condition set from the HHP. This can be done by unplugging one of the DPC Merlin harness connectors and plugging the HHP directly into the harness. Note: You will have to unplug the DPC module to do this and consequently you will get a "Comm" error when Merlin boots up. Press the InterMotive button on the ISP and proceed.

Once connected with the Merlin harness, press and hold the black button on the HHP. Once the Tx/Rx LED begins to flash, the button can be released. The download progress can be monitored on the ISP's LCD screen. The ISP will restart when the condition set is done downloading. The HHP and extension harness can be removed at this time.

Should there be a "Comm" error during initialization, it might point to a number of issues:

1. Invalid configuration setting on a DPC8 (shorting plug) or DPC4 (dip switch setting) module.
2. Loose (intermittent contact) pins on any of the harness connectors.
3. Damaged or broken wires somewhere inside the harness. Check the harness for damage or screws that may have been inadvertently been driven through the harness during vehicle build.

To test Merlin harness:

4. Make sure Merlin logic power is OFF by unplugging from the GTWY401-A1 or removing the fuse that powers the flying Red power lead on MIM systems.
5. Unplug one of the Black Merlin plugs from any DPC module and with your DVM set to resistance, measure across the Yellow and Green wires.
6. Reading should be 60 +/- 5 ohms. Other values can indicate a problem. Call InterMotive for assistance.

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 which installed units are recognized by the ISP, hold down the InterMotive button for three seconds after initialization is complete and view the list of "Detected Modules" in the diagnostic menu. All installed modules should be "detected".

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. Eyelets must be used to ensure a 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. Observe proper torque on these nuts as labeled on the module housing.



The ISP requires an ignition signal for normal operation. This will wake up the system (when key is turned ON) or allow the system to go to sleep (when key is turned 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 module and represents the state of the ignition of the vehicle. Without this signal, the ISP will prematurely go to sleep.

Input / 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. Connect inputs and outputs as designated in the Merlin condition set.

The ISP and DPC units have several inputs available. Some are intended for high true inputs, some for low true inputs. Refer to your Merlin Operations Manual. High true inputs expect a 12 volt signal for an active high state. Low true inputs expect to be grounded to be active.

To ensure that the digital inputs work properly, make sure the ground wire for a (low true) 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 Operations Manual.

TESTING THE SYSTEM

It is always good practice to do a "run through" test **before plugging in any loads**. You can touch your load wires to 12V and ground and make sure they come on and are not shorted. This is best done with a fused jumper wire prior to connecting to the DPC module.

You can also turn on the DPC outputs (no load connected) and ensure the DPC load LEDs come on, which indicates the presence of 12V on the output pin. Based on the given configuration file, make sure each load turns on (correct LED turns ON) with the proper stimulus (button controls, other inputs etc.). You should see the appropriate DPC LED come on.

After ensuring the loads themselves are not shorted, and the DPC loads are working properly, connect the load wires to the DPC modules and test the loads from the ISP once again.

CLEAR CODES

Once the system completed and working properly, enter diagnostic mode by hold down the Intermotive button on the ISP for three seconds and clear all Diagnostic Trouble Codes (Clear All). This will allow any subsequent field troubleshooting to proceed accurately after the bus leaves your facility.