Using PLC and Touch Panels in Automobiles

About this application note, please read:

We have many customers using our controls in automobile applications from Buses, to RV's to race cars, to high performance cars, even in tractor trailer applications for trailer controls. Many of these are used for engine management, or just simple light/heat & air/accessory controls. This application note is not designed to make your application work perfectly. This note was generated to give you some insight as to what a PLC can be used for and what precautions you should take when using a PLC in an auto.

When using a PLC in an auto, you typically will power the equipment from the auto's battery power. You need to take into account noise from starters, alternators etc. Make sure you wire all control wires away from anything that can generate noise. Take all wiring precautions and isolate, filter and fuse all controls for protection and reliability.

We at Automation Direct can only give suggestions, and answer limited questions for your applications, but if you have further questions, please let us know by email or call our tech line @ 770-844-4200.

Thank you and Enjoy.

We used a PLC in our sponsored TRANS-AM SERIES race car. The following notes are what we used it for and how we accomplished the task. Other examples will be listed at the end.

- We integrated our PLC and equipment into the race car in order to capture data (telemetry) to display to the television audience during the race.

- We used our PLC, sensors, pushbuttons, dinnectors and in one application, we used a touch screen.

- We recorded and displayed:

- Wheel speed

- Laptimes

- RPMs

- Cockpit temperatures.

I doubt anyone will ever use a system like we did, but this is just an example of what all can be accomplished with the correct equipment and talent.

We connected special sensors for different applications. RTD for temperatures, CDS (competition data systems) lap sensor for lap times, our Centsable proximity sensors for wheel speed and engine RPMs. In some cases we used pressure sensors for brakes, and linear potentiometers for gear position and rotary pots for throttle position.

We then took the data in the PLC and changed the format and sent the data back out over a serial modem from: ICL (manufacture of communications devices: www.iclinks.com).

We used the TV camera equipment and an audio channel to send the data from our modem into the audio channel to a helicopter flying above the track, back down to a production booth.

We then took the audio signal at the booth, converted it again with a modem and read it into our Laptop, and displayed out over the video port of the laptop.
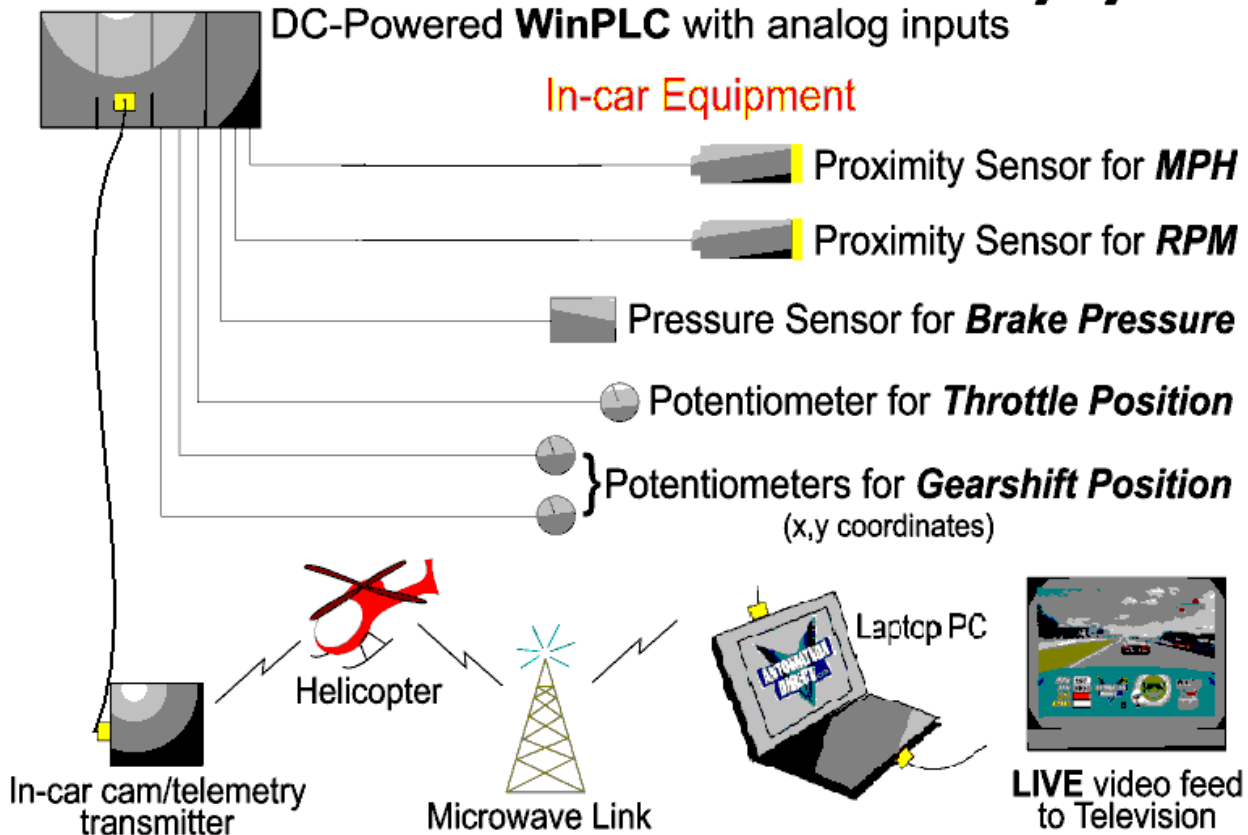
The production crew could then mask our telemetry with the onboard video they received from the car camera and display it on TV as so:

Automationdirect.com Race Car Telemetry System

DC-Powered **WinPLC** with analog inputs

In-car Equipment

Proximity Sensor for **MPH**

Proximity Sensor for **RPM**

Pressure Sensor for **Brake Pressure**

Potentiometer for **Throttle Position**

} Potentiometers for **Gearshift Position**
(x,y coordinates)

Helicopter

Microwave Link

Laptop PC

LIVE video feed to Television

In-car cam/telemetry transmitter

- We used a 205 PLC with a D2-0xBDC1-1 base for use with 12 volt DC power.
- ** When using any control equipment powered from an auto battery, the starter circuit MUST be isolated. Noise from engine starters can cause failures or incorrect reading/data.

• For our control we used an H2-WPLC-CE (WIN PLC from Host Engineering) that was custom programmed for our application. Most customers using PLC's in auto applications will use a standard CPU (240/250-1/260) or even a brick PLC like the 05/06.

• We took advantage of the H2-CTRIO for our high speed inputs and we use F2-xxxx analog modules for inputs from RTD's and potentiometers.

The question has come up many times about using our PLC's and operator panels in automotive applications. Our PLC's will work with 12vdc, but most of our OIP's (EZ-TOUCH & EZ-TEXT) require 24vdc. What did we do? In our case, we chose to use a DC to DC converter. Do a search for suppliers to meet your application needs. We chose to use a 12vdc to 24vdc converter made by: VICOR. If you are only powering an operator panel, the Vicor Mega Mod jr model VI-LJ01-EY may work fine. This takes a 75watt 12vdc input and gives a 50watt 24vdc output.   Again, this is just an example of what we used, we don't guarantee it will work in your application.

WARNING!   This information is to explain how we accomplished a goal. This is NOT an example to follow. We do not, and will not be held liable for any problems you may encounter with any application that may be similar.

APPLICATIONS:

Our application was solely for advertising. It was a complete custom application. We wouldn't suggest this application to be duplicated since there are companies that offer packages that will do this. Also communication technology has increased in the past year/s or so that if we had to do this again, we would chose a new route.
Here are some applications we have encountered that are asked a lot:

• Using PLC control with an EZ-Touch screen for blinkers, lights, heat and cooling and other accessories in an automobile, bus or boat.

The following PLC's are good examples of equipment used in automobiles since they can be powered from the battery: D0-06DR-D or D0-05DR-D. These
will both power from the auto 12vdc or 24vdc battery. If using any of our
operator panels, you will need 24vdc to power them. If you only have 12vdc,
use something like discussed earlier: a 12vdc to 24vdc converter. Vicor is a
brand we have used in the past.
Make sure you filter and fuse all connections and route all wires away from
noise sources: starter/alternator/generator or any electric motors.

- Several customers build custom hand built exotic cars, and choose to use our eztouch panels in the dash for all controls.

- I have encountered tour bus manufactures using many of our PLC's for lighting controls, and accessories for passengers.

- Several applications use our PLC's on boats and barges for engine management as well as headings and engine speeds displayed on the touch screen.

- Some applications would include using our PLCs and eztext panels used on trailer-able machines for control for example: DL06 and EZ-220 is used to control salt spreaders during the winter. In this application, it was critical to have the proper enclosure (Nema 4x or better) and also proper heaters in the enclosure to maintain automation equipment specs.

Technical
Assistance: If you have questions regarding this Application Note, please contact us at 770-844-4200 for further assistance.