OCS Training Workshop
LAB12

Setting up a J1939 network with Horner OCS

Introduction

The objective of this lab is to provide the skills to set up a J1939 network using Horner OCS controllers with the respective firmware and test the network by exchanging some data.

Overview

To begin, the Horner OCS must have the J1939 firmware loaded to the controller. This is pre-loaded factory firmware. It is <u>not</u> available on our website or from technical support for downloading in the field etc.

There are two modes that the Horner OCS J1939 hardware operates under, and each of these modes has two separate variants. These are listed below.
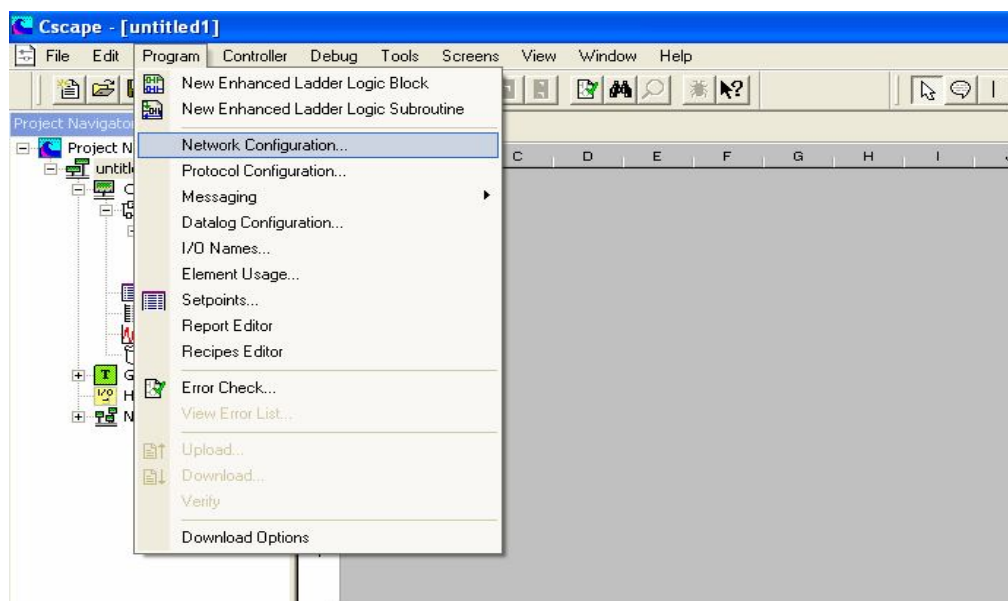
> ➢ Receive Mode
>> - Monitor Mode
>> - Request Mode
> ➢ Transmit Mode
>> - Timed transmit mode
>> - Triggered transmit mode

In this workshop, one OCS will be set up to transmit a PGN parameter with data onto the network and another OCS will be configured as to monitor the network, receive the said PGN parameter and read back the data. Therefore, one OCS will be in timed transmit mode and the other will be in monitor mode.

Cscape Configuration

PART 1 – Network configuration for Receive OCS in monitor mode.

1. Click Program -> Network Configuration

2. This will open the J1939 configuration tool.

➢ In the first field as shown above, enter a %R starting register. As you do this, the grey fields below this will auto-fill. These registers are then assigned/used for various means such as Start/Stopping J1939 network scanning, status values etc. Please refer to the Horner APG User Manual (MAN0913) for XL-J1939 for a detail description of bit values.

3. Right click on the Receive PGN option as seen below and add a new receive PGN.

➤ For this PGN, enter in the PGN parameter that will be monitored on the network relevant to the other piece of hardware transmitting the PGN data onto the bus.

➤ Cycle time can remain 0 because our receive OCS is in monitor mode. A non-zero cycle time here will be used in a request mode situation. It determines the rate at which the network is scanned by the receive mode unit.

➤ Token can be left blank if the PGN number in the first field will suffice.

➤ Priority can remain 0 in this mode (zero is the highest priority given to any PGN). 7 is the lowest possible priority value of any one PGN.

➤ Name allows the user to give the PGN a description. Entering a name is at the user's discretion, it can be left blank also.

➤ Source address is the network ID of the hardware transmitting the PGN data on the network. The network address can be retrieved from the other Horner OCS controller by accessing its system menu. In the case of a third party piece of J1939 hardware (ie) a drive the user must find out the network ID.

➤ Destination address is the network ID of the OCS unit you are configuring this program for, hence the OCS that will be in monitor mode receiving the PGN data.

➤ Enter the valid number of data bytes for your respective PGN.

➤ Enter a Mapping register which will be assigned %Rxxx. Then click OK to exit. It is important not to choose a register which over laps the register you have assigned above for the J1939 Status registers.

4. Open the graphics editor in Cscape as seen below and embed the PGN data on the screen so you can see the transmitted data associated with the respective PGN.
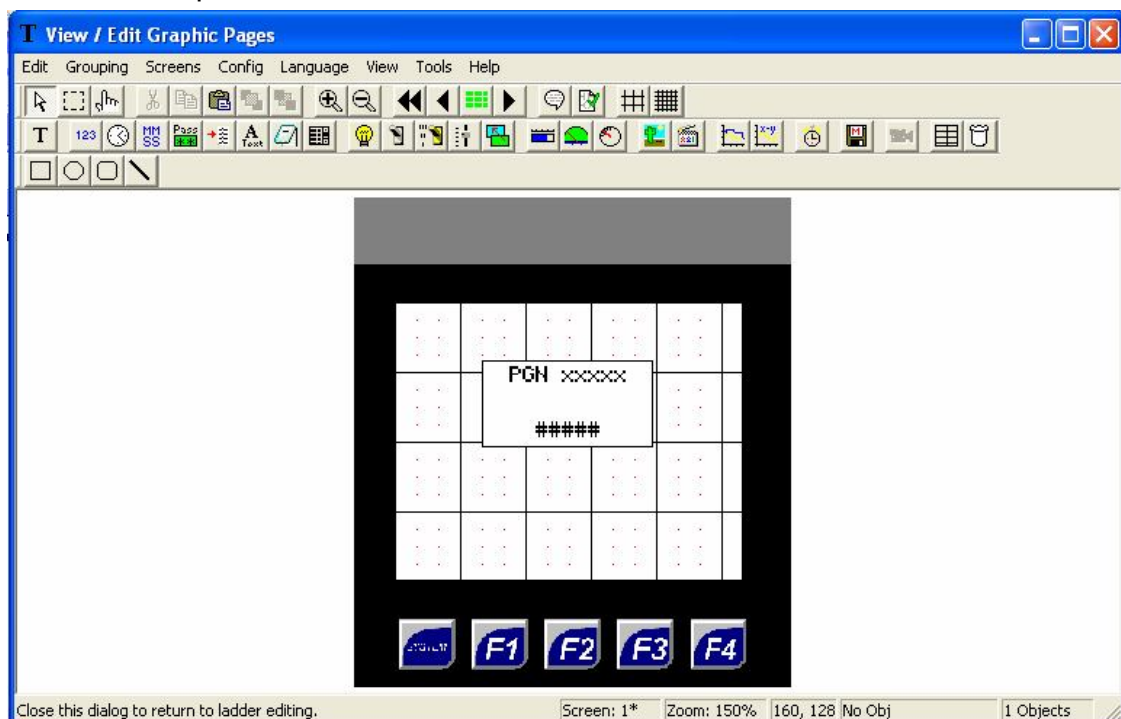
➢ Double click on the embedded data on the graphics editor window and configure the data properties as per the configuration in the J1939 configuration tool (ie) assigned mapping register number, bit size, etc.

➢ Next, create a new page and embed your status values as shown below, similar to the status register values assigned in the J1939 configuration window in section 2 above.
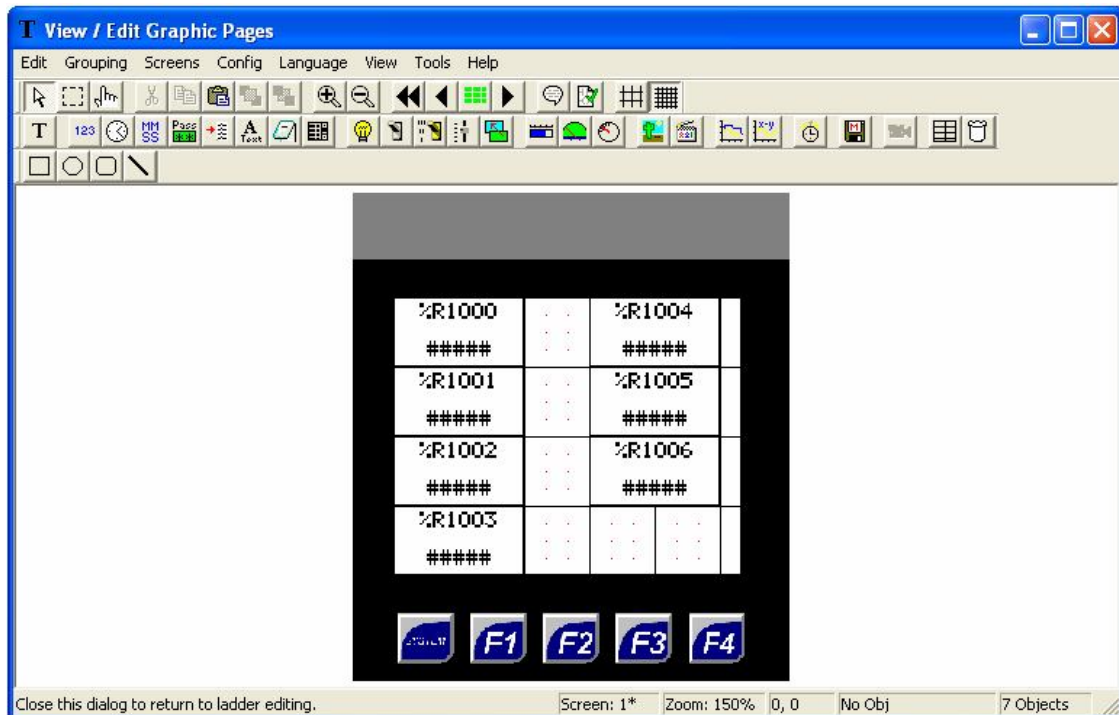
➢ It is very important to have a screen with these values. For example, the user needs to set the value of %R1000 high to enable J1939 communication on the OCS controller.

➢ Exit the graphics editor window, save the program and download to the Horner OCS controller.

**PART 2** – Network configuration for Transmit OCS in timed transmit mode.

1. Copy section 1 in Part 1 above.

2. Copy section 2 in Part 1 above. It might be a good idea to assign a different status register for this OCS (just to distinguish between the two different pieces of hardware on the network). Use %R2000 for example.

3. Right click on the Transmit PGN option as seen below and add a new transmit PGN.
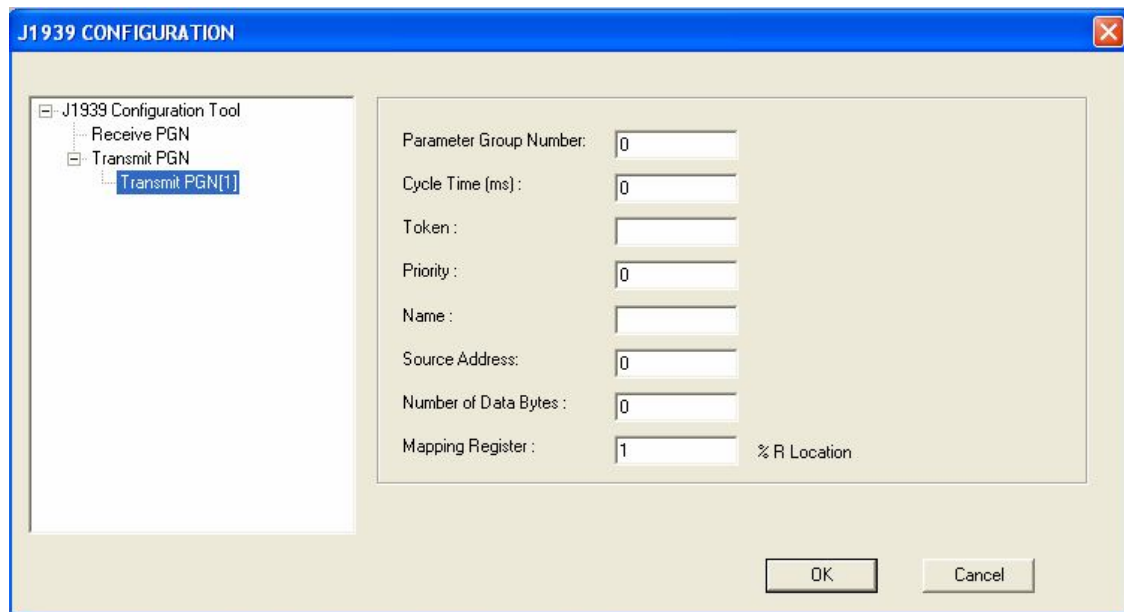
- For this PGN, enter in the PGN parameter that will be transmitted on the network.
- Enter a valid cycle time, 100ms for example. This cycle time determines the rate at which the PGN data is being transmitted on the network. A zero value should only be in this field if configuring the transmit OCS for triggered transmit mode.
- Token can be left blank if the PGN number in the first field will suffice.
- Priority can remain 0 in this mode (zero is the highest priority given to any PGN). 7 is the lowest possible priority value of any one PGN.
- Name allows the user to give the PGN a description. Entering a name is at the user's discretion, it can be left blank also.
- Source address is the network ID of the hardware transmitting the PGN data on the network. This is the ID of the unit we are now working on.
- Enter the valid number of data bytes for your respective PGN.
- Enter a Mapping register which will be assigned %Rxxx. Then click OK to exit. It is important not to choose a register which over laps the register you have assigned above for the J1939 Status registers.

4. Copy section 4 in Part 1 above.

- This time creating a screen with status registers relevant to the status registers assigned in the J1939 configuration tool. See below:
- Remember to set the value of %R2000 high to enable J1939 communication on the OCS controller.
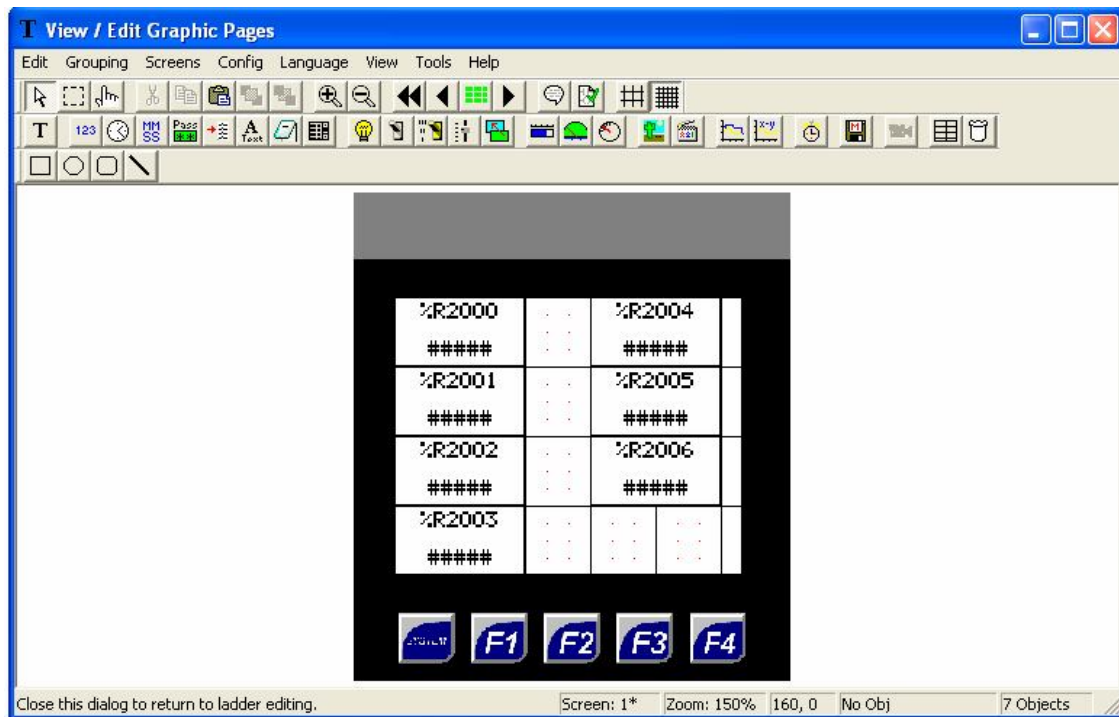
PART 3 – Exchanging Data between the two OCS controllers.

- With register %R1000 and %R2000 set to 1:

- Enter in a value for the PGN parameter on the screen of the Transmit OCS. This value will then be transmitted on the network and the PGN parameter field on the screen of the Receive OCS will read back the same value. Hence both PGN fields should now read the same value.

End of LAB 12