TECHNICAL NOTE
MOTION PRODUCT AND ENGINEERING GROUP

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Subject: Using Exor HMI with MP9xx Controller
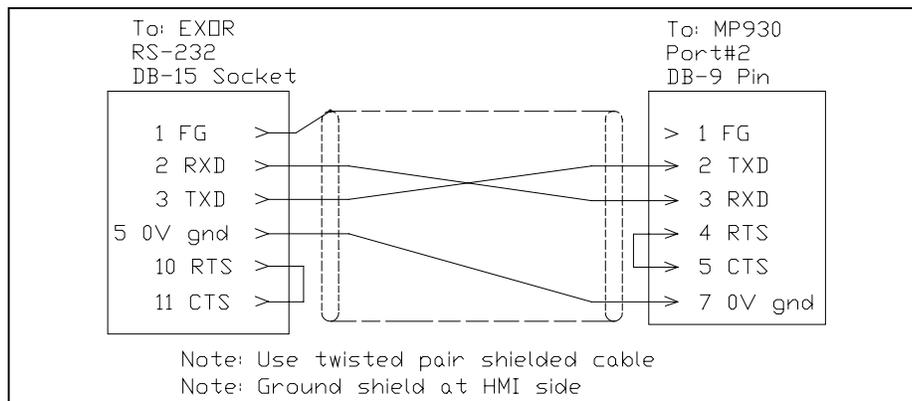
Product: MP9xx

Summary: This document highlights the steps that must be performed to make an Exor HMI product communicate with a Yaskawa MP9xx controller product.

Exor's Touch Panels and Alpha Numeric Products use a universal programming software. Products specifically tested at Yaskawa are indicated below.
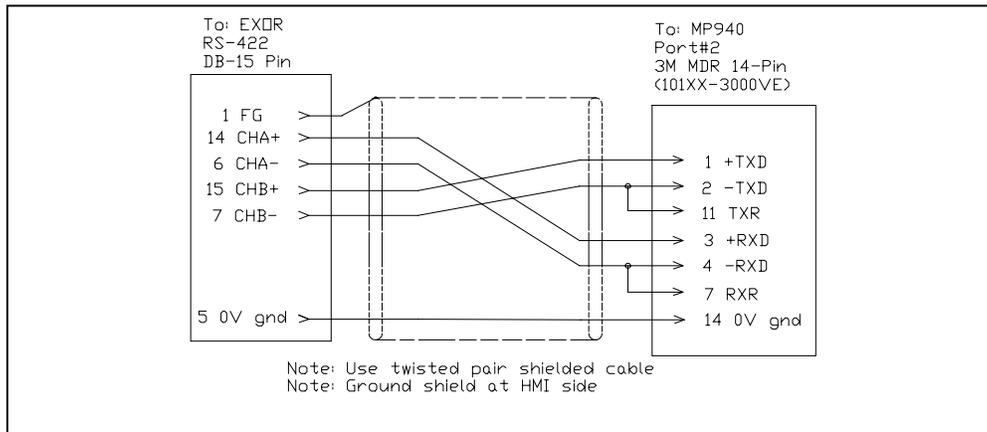
Touch Panel and Alpha Numeric

Software:	Designer UniOP, version 5.06 (03), and 5.05 (00)
Touch Panel:	UniOP ELT-16-0045
Number of nodes:	Up to 63 slaves node can be connected
Alpha Numeric:	UniOP MD02R-04
Drivers:	Status = fully tested and operational
	Must install the following driver by simply copying it to the proper directory:
	C:\Program Files\Designer\Uplc135.dll (7/20/99)

MP930 RS-232 Cable Diagram


```
To: EXOR                                    To: MP930
RS-232                                      Port#2
DB-15 Socket                                DB-9 Pin

  1 FG   >                           >  1 FG
  2 RXD  >                           >  2 TXD
  3 TXD  >                           >  3 RXD
  5 0V gnd >                         >  4 RTS
 10 RTS  >                           >  5 CTS
 11 CTS  >                           >  7 0V gnd

        Note: Use twisted pair shielded cable
        Note: Ground shield at HMI side
```

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MP940 RS-422 Cable Diagram


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To: EXOR                              To: MP940
RS-422                                Port#2
DB-15 Pin                             3M MDR 14-Pin
                                      (101XX-3000VE)

  1 FG                                    1 +TXD
 14 CHA+                                  2 -TXD
  6 CHA-                                 11 TXR
 15 CHB+                                  3 +RXD
  7 CHB-                                  4 -RXD
                                          7 RXR
  5 0V gnd                               14 0V gnd

        Note: Use twisted pair shielded cable
        Note: Ground shield at HMI side
```

For short distances (1-2 ft), the signal ground connection (Exor-5 and MP940-14) and the MP940 terminating resistor pins (11, 7) are not required. However, longer cable lengths and industrial installations are more prone to noise and should follow the diagram strictly.

The signal ground is not absolutely needed due to the protection isolation and protection circuitry on the MP940 side. However, this connection is recommended.

Communication Notes:

For RS-232 communications with the MP930 system, the hardware handshaking is not required for communications control. In rare cases where errors occur from buffer overflow (sometimes caused by high communication speed, long lines, and extremely noisy conditions), the use of RTS/CTS lines may help by controlling communication timing. DSR/DTR signals are not used in this system and are not necessary. They are typically required for systems to indicate that the equipment is on and able to communicate, such as with modems.

Field Ground Notes:

Please take note of the wiring techniques described below to insure a successful system integration. The field ground (or chassis ground) connection is a required safety connection, and is highly recommended for noise reduction. It also provides a means for Electro Static Discharge (ESD) to return to ground without disturbing the electronics within the HMI or MP940.

Communications Cable Shield Termination:
Yaskawa recommends that the shield of the communications cable be connected only to the HMIs field ground wire (or terminal), as indicated in the wiring diagram. Since the RS-232 and 422/485 communication links are bi-directional, in some rare cases the shield connection to both sides is possible. Connection at the receiver end is not recommended in a low power system due to the possibility of setting up a circulating ground current.

FG Note: When connecting the shield, it is best to use techniques to maintain as much of the surface area as possible to provide a low impedance path for the high frequency noise (high frequencies travel on the skin of a wire).

Field Ground HMI Side:
If the HMI is mounted to a door, a large gauge ground braid must be connected between the panel door and the panel housing. Do not rely on the hinges for the chassis ground, as over time

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they will corrode and the earth connection will become higher impedance. This reduces the effectiveness of the earth connection.
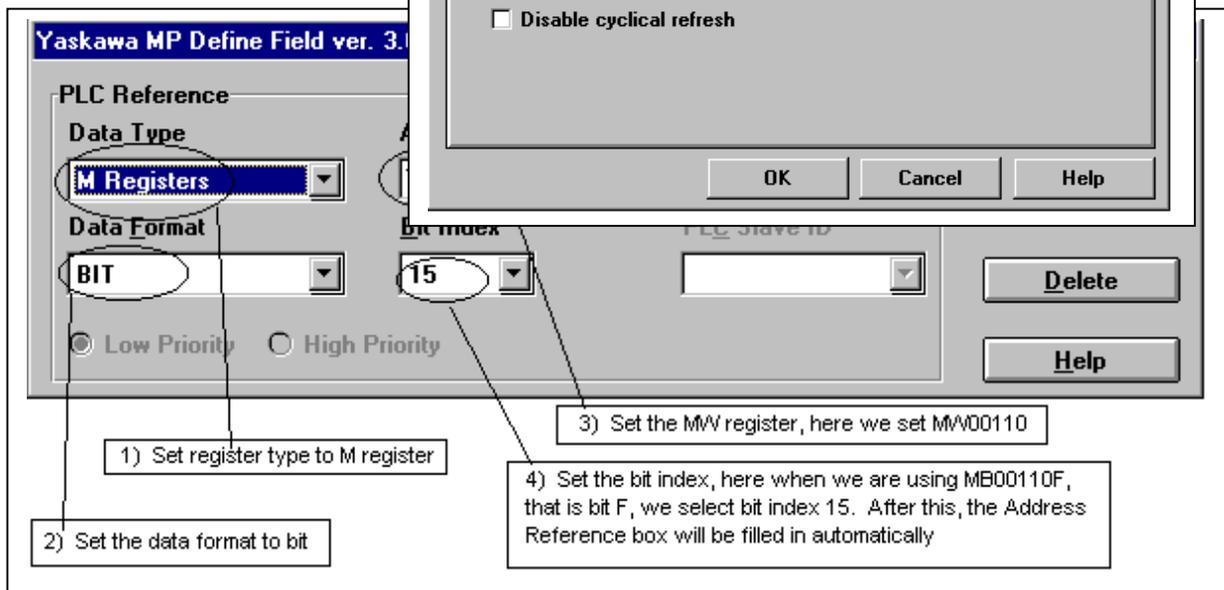
Connect a heavy braid between one of the HMI mounting studs and a good earth connection. This will not only provide a chassis ground to the door of the enclosure, but will also provide a chassis ground to the enclosure of the HMI. Be sure that a good electrical connection exists; the use of a star washer is recommended because it cuts through any paint on the enclosure. A grounded braid is used to increase the surface area of the grounding wire (see FG note above).

Field Ground MP-940 Side:
Be sure to connect the FG on the MP940's control power connector to the FG screw on the SGDH Amplifier unit with a short wire. This will provide a low impedance FG path and lower the occurrence of noise over the Dual Port RAM connection. Make sure a good ground connection is connected from the SGDH amplifier FG screw to the control panel's main ground location (a star-ground configuration as shown in the SGDH manual is recommended).

Setting up a button reference:

First select a button. Opening up the properties will give you three tabs. Select the reference tab, and click on the "Button Reference" or "Light reference" to get the next window below (Define Field). Follow steps 1-4.
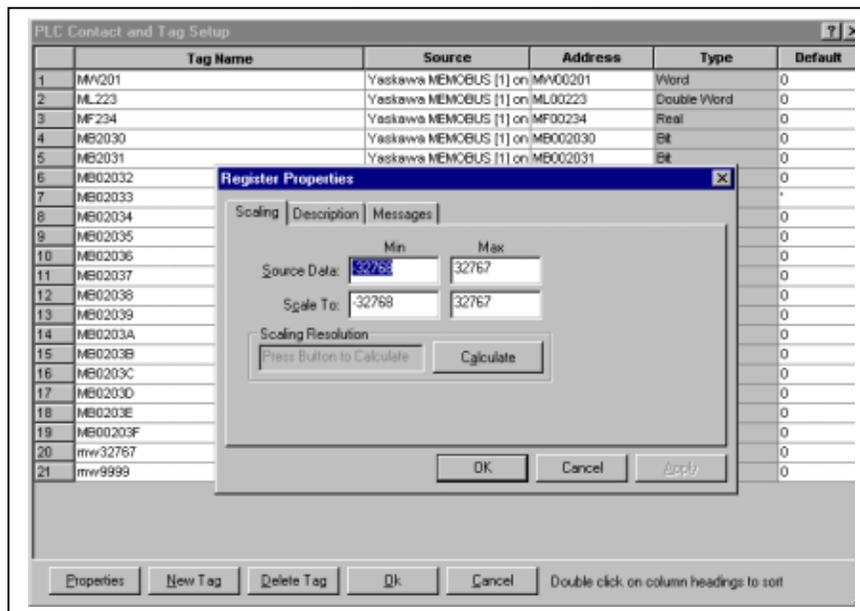
Tag List Setup Tip:

There is not a utility to import or export tag lists. They must be keyed in by hand as shown below. This window can be reached via the "Setup" menu dropdown, and selecting Tags. Enter the tag name, select the source driver as "Yaskawa Memobus", and fill in the "Address" field. The address field is a smart field and will auto detect the type and default digits. To set register properties, click on "Properties" button to get the default scaling levels and formatting..

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Supporting Documents:

Eng/01.013/MCD: Differences Between Memobus and Modbus