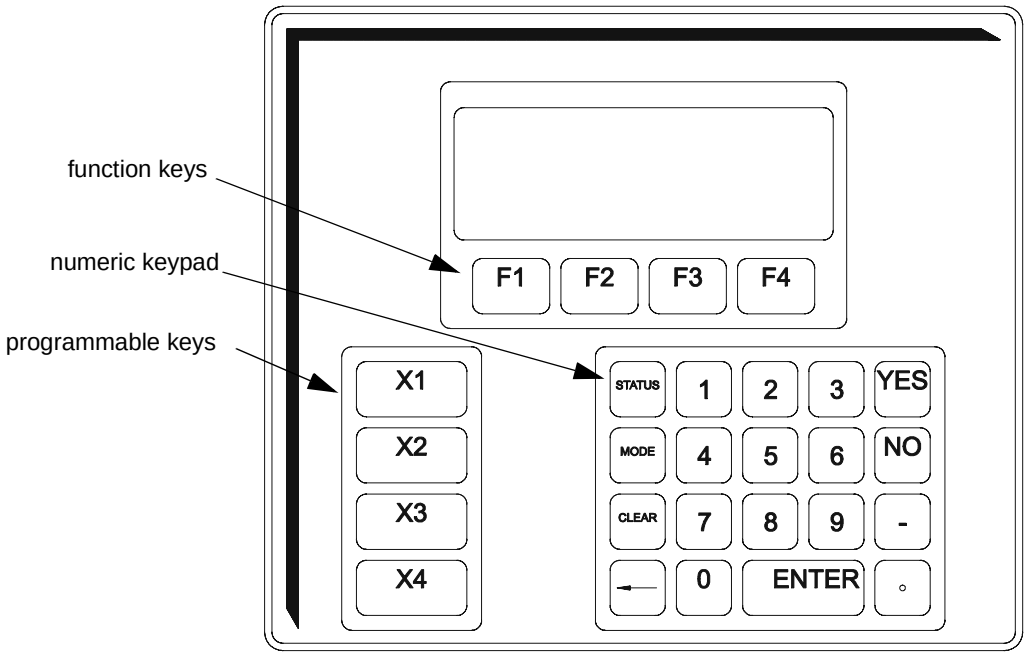
Installation Instructions

1398 Operator Terminal for the 1398 ULTRA Plus

The Allen Bradley ULTRA Plus Operator Terminal allows the machine operator convenient access to status information, program variables, control functions, and message display capabilities. The Operator Terminal has a bright 4 line by 20 character vacuum fluorescent display and a sealed membrane keyboard with tactile feedback.

The ULTRA Plus Operator Terminal displays multiple status screens for monitoring and diagnostics. Four programmable function keys are available to perform up to twenty-four (24) predefined functions, some of which are selecting and running a program, jogging the system, and stopping a program. The ULTRA Plus user program may display messages and prompts on the screen, and receive input from the keypad. Four additional user programmable keys identified as "X" keys provide extra flexibility within a user's program. Input power to the Operator Terminal is 24 VDC ±20% normal.

Figure 1:
ULTRA Plus Operator Terminal (front view)



Mounting

The Operator Terminal is designed for through-panel mounting. A neoprene gasket is provided, to enable sealing to NEMA 4/IP65 specification. All mounting holes should be drilled for 0.14" clearance. Care should be taken to remove any loose material from the mounting hole to avoid such metal falling into the Operator Terminal itself during installation.

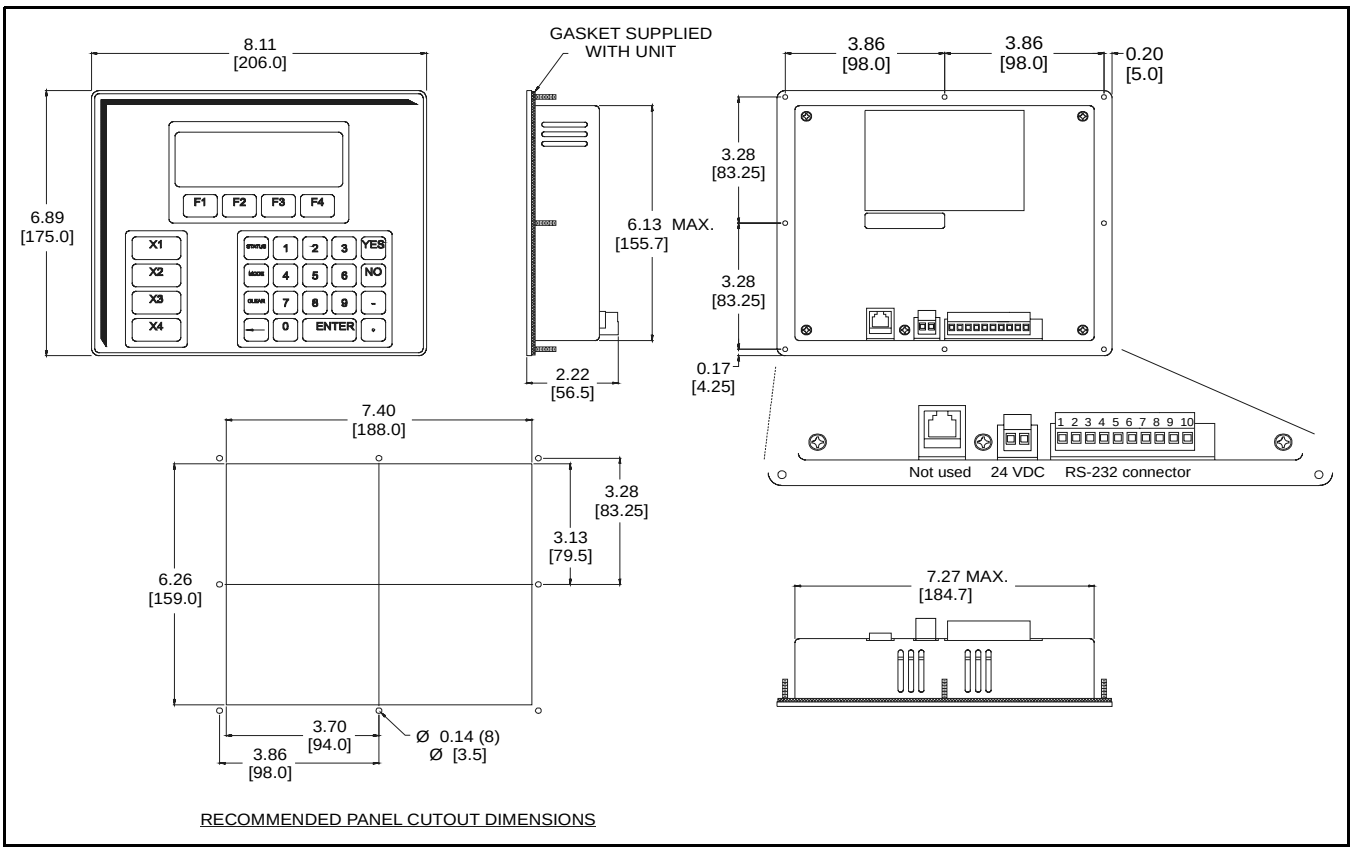
The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided. Continuous exposure to direct sunlight may accelerate the aging process of the bezel. The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents.

TIP

Do not use tools of any kind (pens, pencils, etc.) to operate the keypad of this unit.

The surface can be damaged by pressure caused from hard or pointed tools.

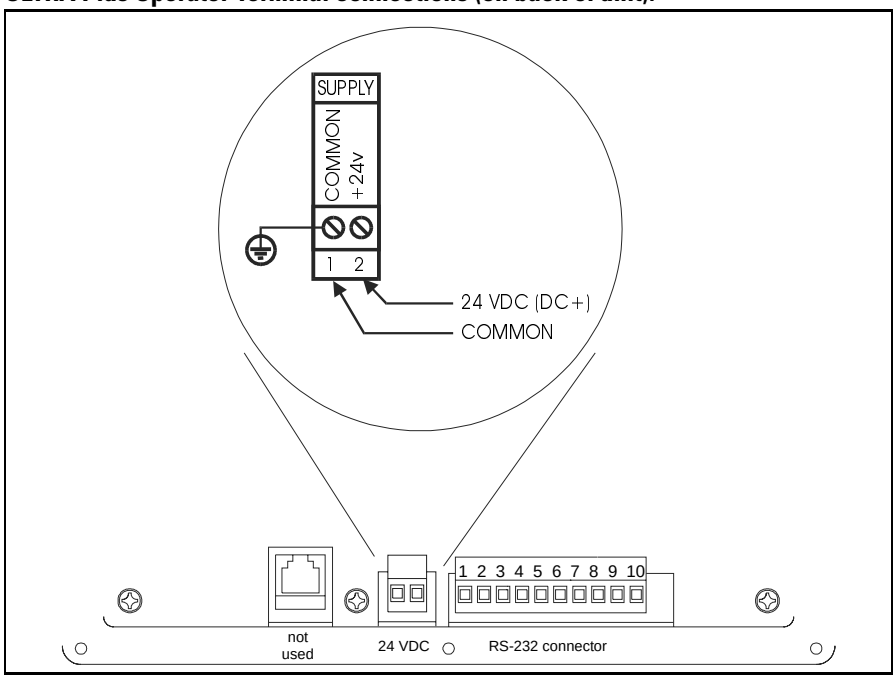
Figure 2:
Operator Terminal (dimensions)



Wiring

The ULTRA Plus Operator Terminal requires a 24 volt power supply rated at 0.5 amps unless otherwise stated on the label

Figure 3:
ULTRA Plus Operator Terminal connections (on back of unit).



- The Operator Terminal requires a power supply capable of supplying a current of 500 mA at a regulated voltage of 24 volts. Supplies providing between 18 volts and 30 volts are also suitable.
- The terminal may take as little as 100 mA in certain circumstances, so be sure that the chosen power supply can operate correctly with this load. Large switch-mode supplies tend to need a certain minimum load before they will operate correctly.

It is very important how the power supply is mounted in relation to the Operating Terminal. Observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet of cable between the supply and the Operator Terminal. Ideally, as short a length as is possible should be use. In particular, the power supply should not be mounted on the back of the panel when the Operator Terminal is installed in the panel door unless a short cable run can be achieved.
- The wire used to connect the Operator Terminal to its power supply should be at least 22 gauge wire. If a longer cable run is used, you will need to increase the cable gauge. The routing of the cable should be kept away from contactors, inverters and other devices that generate significant electrical noise.

Serial Connection

The ULTRA Plus Operator Terminal connects to the ULTRA Plus Positioning Drive Module. The connection may be wired using RS-232 for distances up to 15.2 meter (50 feet).

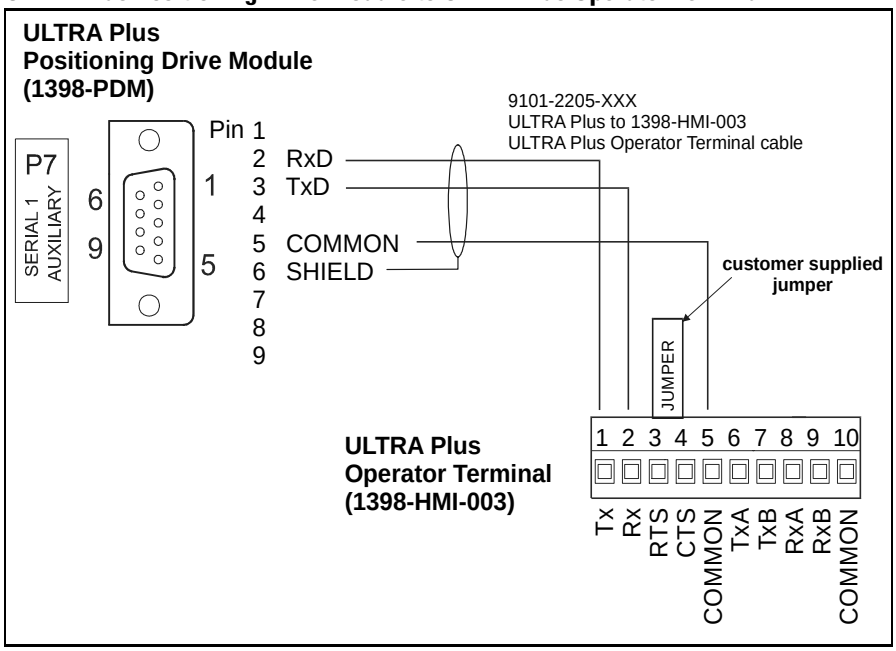
ULTRA Plus Positioning Drive Module (P7, Serial 1 Auxiliary)

	Signal names	
Pin	**RS-232**	**RS-422**
1	No connection	RxD+
2	RxD	RxD-
3	TxD	TxD-
4	No Connection	TxD+
5	Common	Common
6	Shield	Shield
7	No connection	
8	No connection	
9	No connection	

ULTRA Plus Operator Terminal (screw terminal on back)

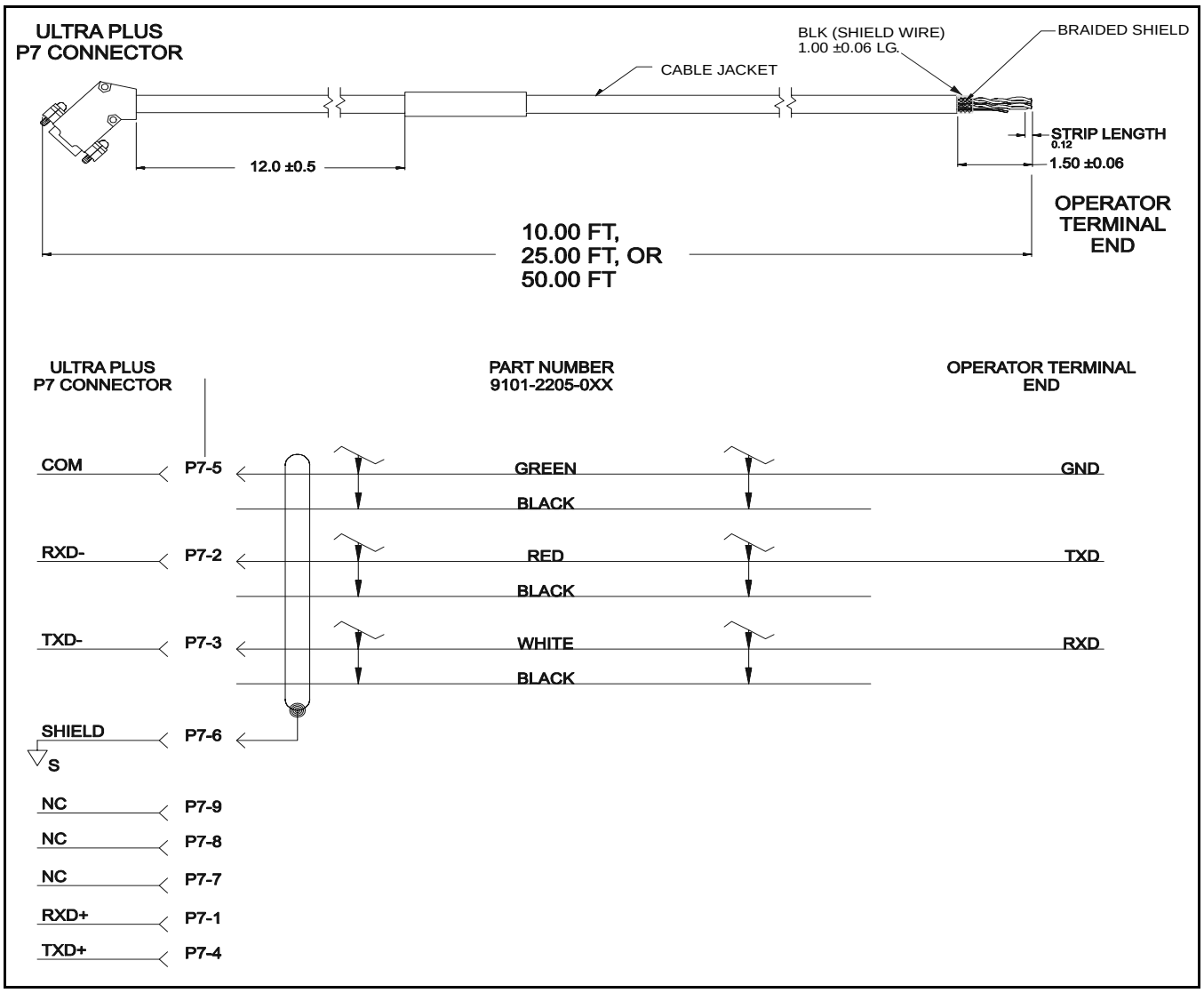
	Pin and Signal names		
Pin	**RS-232**	**Pin**	**RS-422**
1	Tx	6	TxA
2	Rx	7	TxB
3	RTS	8	RxA
4	CTS	9	RxB
5	Common	10	Common

Figure 4:
ULTRA Plus Positioning Drive Module to ULTRA Plus Operator Terminal



IMPORTANT A jumper (customer supplied) must be installed between pins 3 and 4 of the ULTRA Plus Operator Terminal for RS-232 operation.

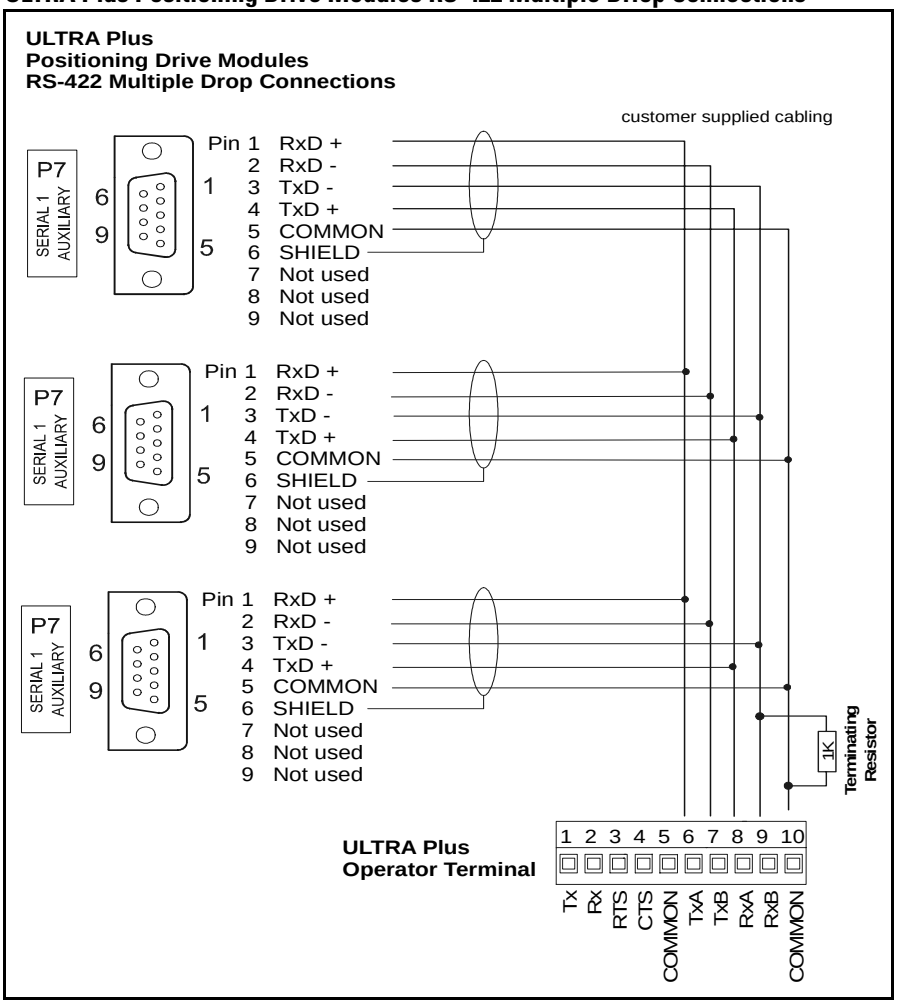
Figure 5:
ULTRA Plus Positioning Drive Module to ULTRA Plus Operator Terminal cable (9101-2205-0XX)



Networking

One ULTRA Plus Operator Terminal can connect to multiple ULTRA Plus Positioning Drive Modules. This method requires customer supplied RS-422 cable connections. A particular ULTRA Plus Positioning Drive Module may be selected from the terminal by using the "NO" key followed by the numeric key corresponding to the ULTRA Plus Positioning Drive Module address. Refer to the ULTRA Plus Positioning Drive Module *Instruction Manual* for further details.

Figure 6:
ULTRA Plus Positioning Drive Modules RS-422 Multiple Driop Connections



IMPORTANT The 1k Ω ¼ watt terminating resistor is used for noise suppression.

Status Screens

The ULTRA Plus Operator Terminal has 9 status screens that may be accessed by pressing the STATUS key. Each time the STATUS key is pressed the next status screen is displayed. The BACKSPACE key can be used to scroll backwards through the status screens. The CLEAR Key will remove the status display or clear the peak values.

Variables available from ULTRA Plus Operator Terminal status screens

Variable	Description
Name	Refer to the ULTRA Plus Positioning Drive Module manual, Language Reference for detailed information about each flag and variable
Status Flags	ATHOME, HSEQCPL, INPOSN, ERROR, XFER, READY, ENABLED, PAUSE
Program Status	Program Number. If compiled with the debug option ON, the instruction that is executing will also be displayed.
Position Status	PCMD, POSN, FE
Velocity Status	VCMD, FVEL1, VEL2
Input Status	Inputs 1 through 16. Inputs 17 through 48 if an Expansion I/O or Memory and Expansion I/O card is installed.
Output Status	Outputs 1 through 8. Outputs 9 through 24 if an Expansion I/O or Memory and Expansion I/O card is installed.
Current Status	ICMD, IAVE, IN PEAK CURRENT
Commanded Position Status	PGEN, PJOG, PEXT
Peak Status	PFE, PVEL1, PICMD

All position values displayed on the Operator Terminal status screens are in user units, velocity values are in user units per timebase, and current (torque) variables are in amps.

Specifications

ULTRA Plus Operator Terminal specifications

Operator Terminal	Specification
Input voltage Standard	 24 VDC ±20% Nominal
Supply	0.5 Amps
Temperature Operating Storage	 32° to 104°F (0° to 40°C) ambient 4° to 176°F (-20° to 80°C) ambient
Humidity	80% maximum, non-condensing
Weight	2.3 lb. (0.1 kg)
Display	Vacuum Fluorescent Display, 4 lines by 20 characters Characters 5 mm high
Front panel seal	NEMA 4/IP65 Indoor use

ULTRA Plus Operator Terminal RS-232 cable specifications

Part Number	Description
9101-2205-010	ULTRA Plus Positioning Drive Module to 1398-HMI-003 ULTRA Plus Operator Terminal (10 FT cable)
9101-2205-025	ULTRA Plus Positioning Drive Module to 1398-HMI-003 ULTRA Plus Operator Terminal (25 FT cable)
9101-2205-050	ULTRA Plus Positioning Drive Module to 1398-HMI-003 ULTRA Plus Operator Terminal (50 FT cable)

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