

# MachineMate Control Installation Checklist

This is a brief checklist for a MachineMate control installation:

1. Mount and connect the MachineMate control.  
See the Hardware Manual section 2 for mounting information, section 3 for control cabling information and section 4 for IO cabling information.
2. Define the actual IO configuration for the control.  
This activity defines which byte numbers are assigned to the input bytes and to the output bytes. The electrical requirements should be known; the schematics might be completed.  
This activity is different for the different IO bus technologies.  
See the Start Up Manual section 2. There is a different paragraph for each IO bus.
3. Define the actual drive configuration for the control (either: analog or SERCOS).  
This activity defines which axis (and spindle) letters are connected electrically to which analog connectors or sercos ring ID numbers. That wiring should be known, if not completed.  
See the Start Up Manual section 3. There is a different paragraph for each drive interface.
4. Define the initial machine parameters required for a control start up.  
This activity connects the letters used in the control (for the display and a part program) with the letters defined in the drive configuration file.  
See the Start Up Manual section 4.
5. Define the initial machine parameters for the axes.  
This activity is different for the different drive interfaces.
  - A. Analog System – machine parameters  
This activity defines axis speed, acceleration, gain and the feedback resolution for each axis (i.e., analog voltage D/A resolution, the number of encoder counts for correct position display). See the Start Up Manual section 5 for an analog system.
  - B. 1. SERCOS System – machine parameters  
This activity defines axis speed, acceleration and gain for each axis. See the Start Up Manual section 6 for a SERCOS system.
  - B. 2. SERCOS System – SERCOS parameters  
This activity defines Sercos telegram type, primary mode of operation, axis type and axis scaling. See Start Up Manual section 6 for a SERCOS system.
6. Develop the initial PLC application for the machine configuration.  
This activity configures the PLC to enable the basic control operations: the correct number of drives are enabled, the CNC will allow the control to have the emergency stop condition occur and reset, axes can be jogged and the CNC will allow an MDI statement to be executed, via the cycle start push button.  
See the Start Up Manual section 8 for a description of the basic requirements for this initial PLC application.  
Note that MachineMate Inc has developed a number of PLC application templates to make this task easier. These templates are available from the web site.
  - Plcstartup is a structured text (ST) project that is in Start Up Manual appendix B.
  - Plcstartup\_ld is the same project as the last but as a ladder diagram (LD) project.
  - Plcstartup\_mtbp is a ST project that includes both the Appendix B application and the support for the MachineMate MTBP.
  - Plcstartup\_mtbp\_ld is the same project as the last but as a LD project.
  - Mpg is a PLC application module (POU) that can be imported into a PLC application to include the logic to support the MachineMate handheld pendant with its MPG. Either a ST or LD POU is available for import into an application.

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- Mtbp is a PLC application module that can be imported into a PLC application to include the logic to support the MachineMate MTBP, but in this case the plcstartup template is not used for the application basis. Either a ST or LD POU is available for import.
- Toolmgt and toolmgt\_ld are projects for tool data management from the PLC. These are written to run in a CNC simulation since no IO is involved in the data management. However, the code (in either ST or LD) can be easily adapted to an actual application with a tool change mechanism.

One of these plcstartup projects can be easily adapted for the initial PLC application (based on if the MTBP and/or MPG is used). Probably the only editing that is required with any of these is the correct assignment of byte numbers for the IO in the initial application: drive IO, MTBP IO, etc.

7. Check the axis motions in MANUAL mode.

This activity tests the feedback resolution for each axis as well as the correct polarity for the output to the drive.

See the Start Up Manual section 9.

⇒ At the end of this step, all axes are moving correctly.

8. Configure the homing sequence.

This activity configures the homing sequence and parameters for the axes, including: the axis order for homing; for each axis: home in which direction at which velocity and move to where after the reference; the software travel limits to apply after homing.

For an analog system, the PLC application defines the physical input points for the home switches.

See the Start Up Manual section 10.

9. Configure the handwheel, if any.

This activity is required only if the system has one or more handwheels. An IO handwheel is in the MachineMate handheld pendant (MPG). An encoder handwheel can be supported also.

See the Start Up Manual section 11.

10. Configure the spindle(s), if any.

This activity is required only if the system has one or more spindles.

See the Start Up Manual section 12.

⇒ At this point, all the basic control features are configured and available.

11. Configure other control features for the specific machine configuration.

This activity depends on the particular machine and control features and options.

See the Start Up Manual sections 13 through 18 (as needed).

12. Develop the PLC application for the machine configuration.

This activity depends on the particular machine features and options (for example, if there is a spindle gear box or a tool change mechanism, the PLC application is responsible for some or all of the implementation). Step 6 above provided an initial PLC application.

See the PLC Programming Manual for information about the PLC programming tool (including the syntax details for the structured text or ladder diagram IEC1131 languages).

See the PLC Interface Manual for information about the PLC requirements to support various features that involve the CNC (like a spindle gear box or tool data management).

13. Save all the files involved in the control application.

This task should be done periodically to recover from computer problems. A single floppy can be used for an archive location for all control files and perhaps many of the part programs as well.

See the Start Up Manual section 19 for more information.

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