ShopFloorManager Technotes

Creating CNCs & Machine Tools PDF-Version

How to create any Machine Tool & Set their Parameters

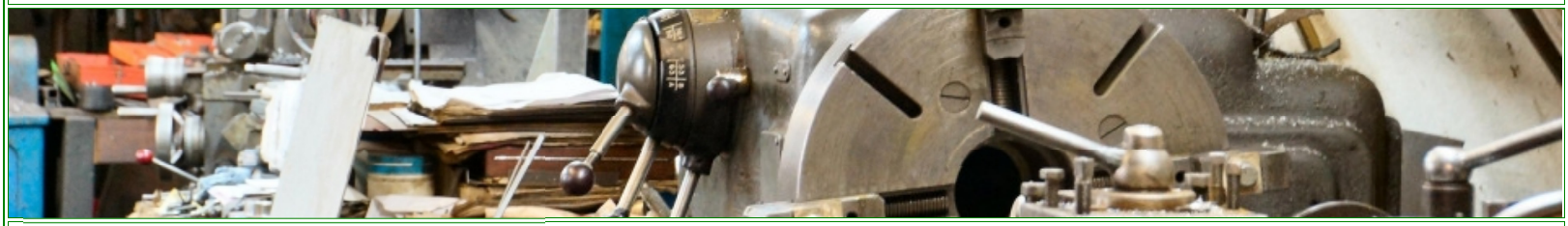
Customers can Create and Manage any number of Machine Tools & Manual Work-Centers

Supports Windows 8™, Windows 7™ & Windows™ XP including Support for Terminal Server 2003/2005/2008

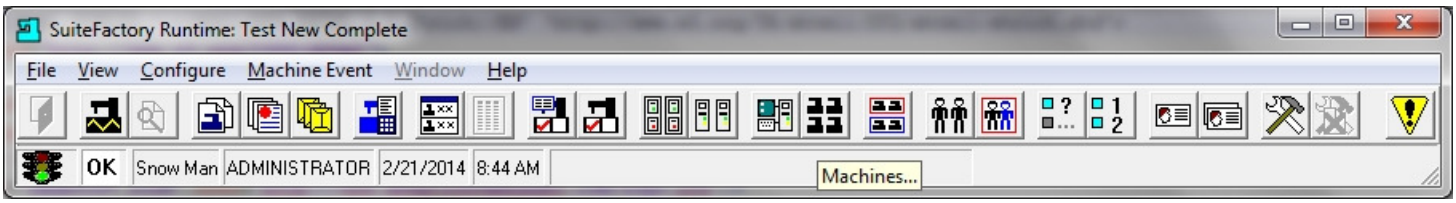
ShopFloorManager supports any type of "Machine Tool" no matter whether it is an RS232, Ethernet, FTP or Manual. You can create your own protocols or select from the included specials developed over the years. These "Machine Tools" can be configured to collect Events for Production Cycle Times, Probe Measurements, Maintenance States, etc. or virtually any type of Machine or Production Event.

You can select any networked computer(s) to host ShopFloorManager's Communications Engine which can support communications from one to 1024 Machine Tools. Machine Tools can request and upload DNC Files, Help Files, Lists of Commands, etc. right from the Controller. A Unique set of Remote Commands can be established for each Machine Tool as well as many other specific options providing customized support for all of your Company's Machine Tools.

Machines: Creating and Managing all of your Manufacturing Machine Tools

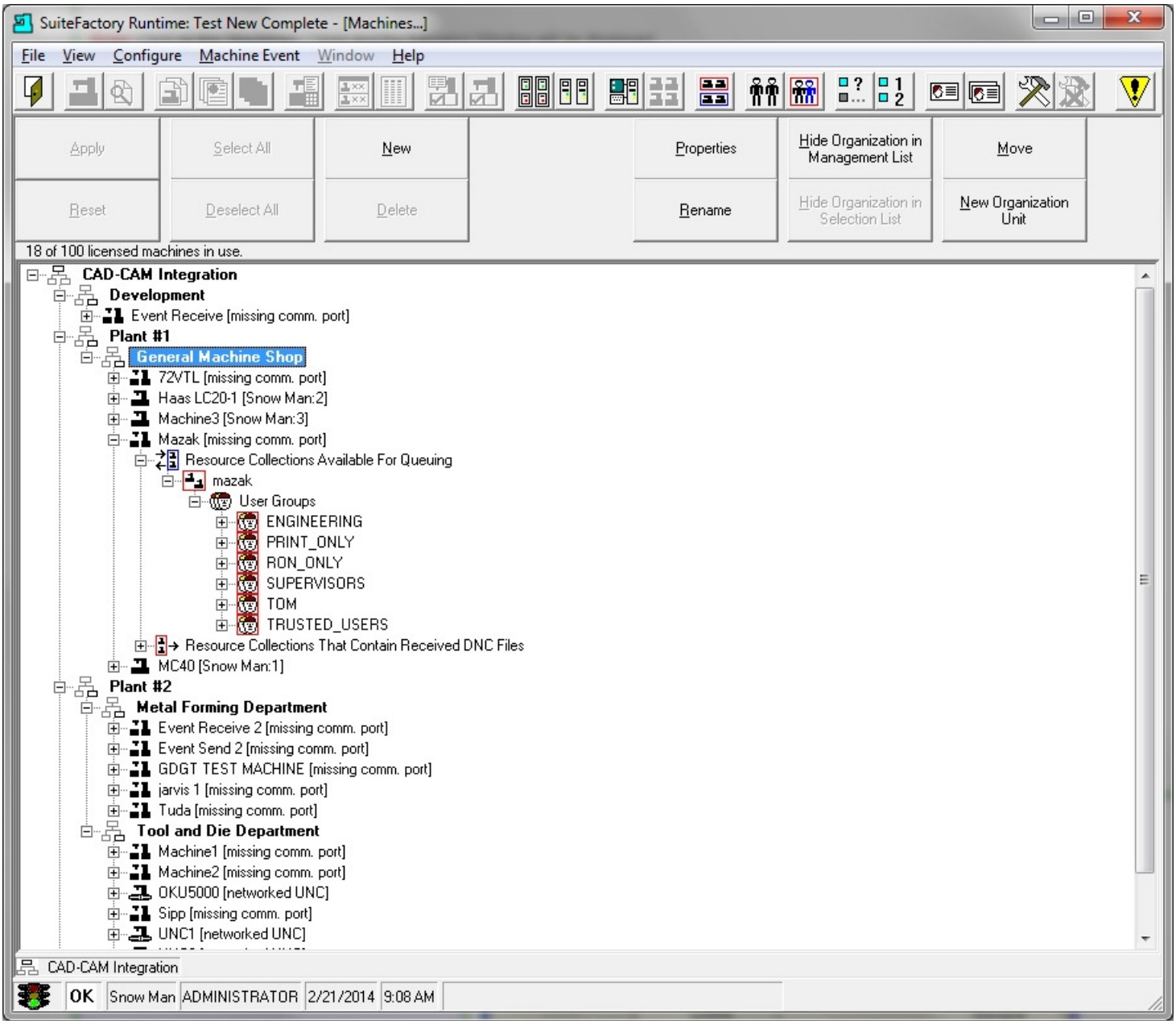


ShopFloorManager Runtime



Note: Click on the "Machines..." Icon and the following Window will be displayed.

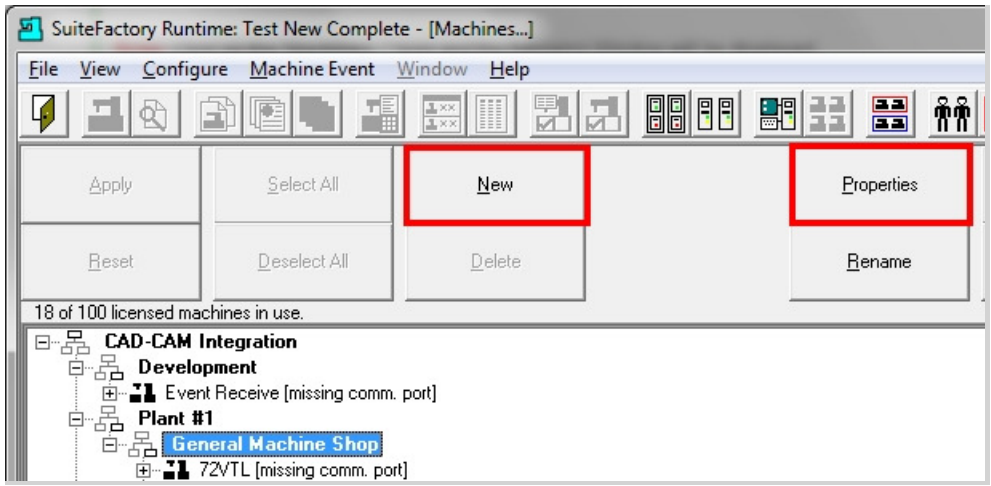
ShopFloorManager Runtime - "Machines"



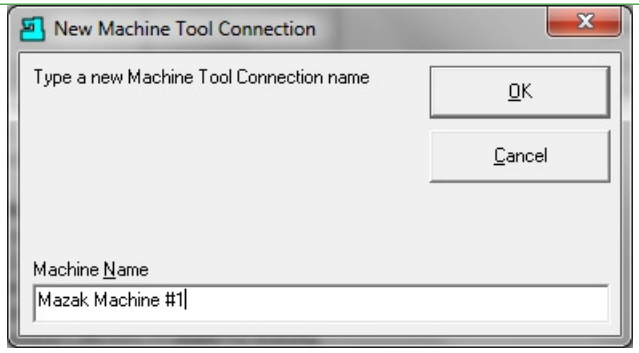
Note: To display the above Window click the "Machines..." Icon from ShopFloorManager Runtime

Creating A Machine

Click on the New Button:



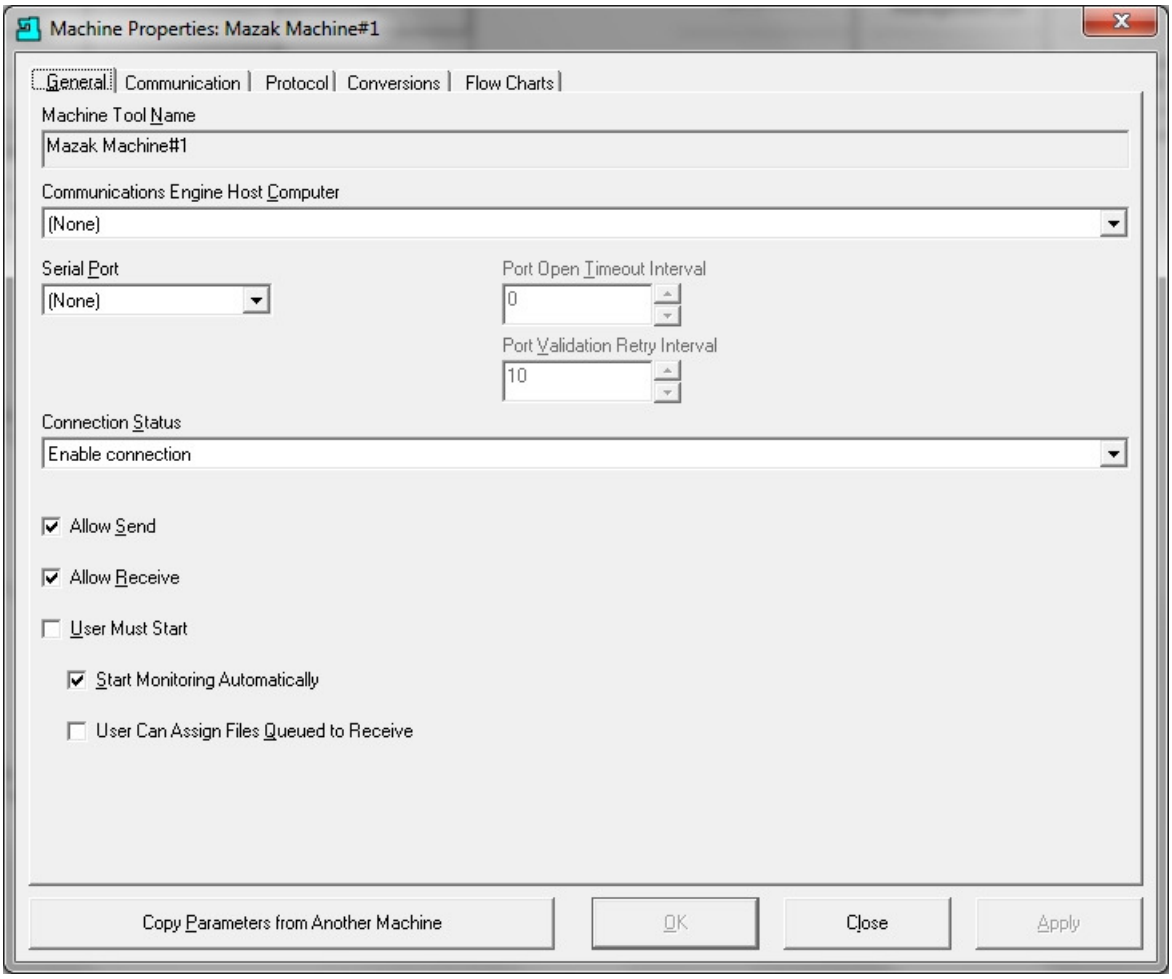
Enter Name of the Machine:



Note: Select the "Machine" Name to reflect how it is recognized on the Manufacturing Floor!

Setting Machine General Properties

Click on the Properties Button or the General Tab:



Settings:

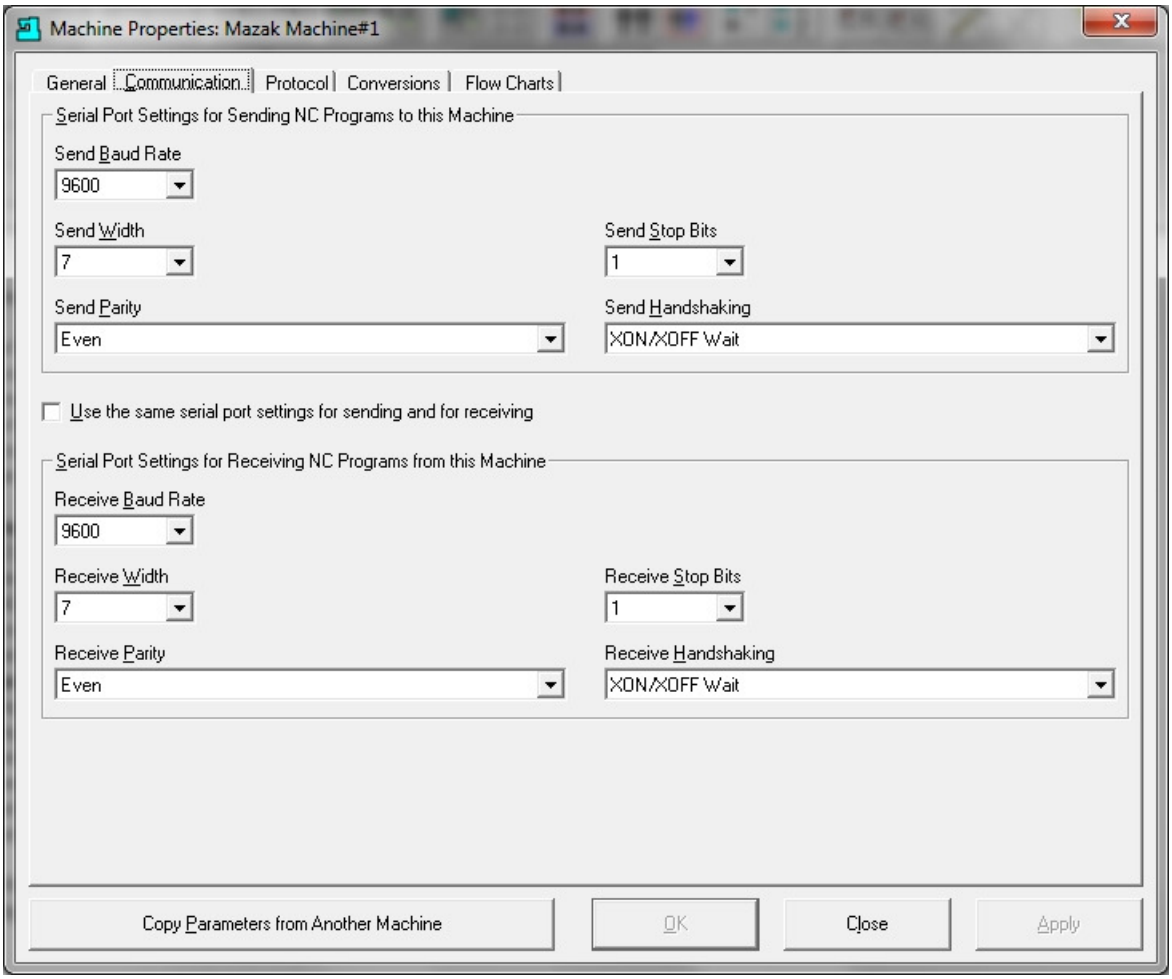
- **Machine Name:** If you want to change the Machine's Name click on the "Rename" Button. Changing the Name will not effect any of the settings.
- **Communication's Host Computer:** The drop list shows the physical workstations available to which this Machine Tool can be assigned. The physical workstation chosen for this Machine Tool will need to Host a "Communication's Engine" for at least this Machine Tool. The chosen workstation can support multiple Machine Tools and requires that the necessary Serial(Wireless or otherwise) Driver(s) are installed for all of it's Machine Tool's Serial Ports. When ShopFloorManager Runtime starts, the "Communication's Engine" will start up Automatically on the assigned Physical Workstation.

  Note: The Communications Engine Runs independently of ShopFloorManager Runtime and since it can be running on multiple workstations you can manage your communications load balancing. For More information see details on http://www.shopfloormanager.com.

- **Serial Port:** Chose the Port you want to assign to this Machine Tool.
- **Port Open ... :** Technical - Don't change this value.
- **Port Validation ... :** Technical - Don't change this value
- **Connection Status:** Leave this as Enable Connection
- **Allow Send/Receive:** Check both of these. These are the usual default values
- **Start Monitoring Automatically:** Leave this as Checked. Monitoring is this sense is automatic viewing of communications activity not of Machine Events!
- **Users Can Assign Files Queued to Received:** Leave this as Un-Checked for General Shop Operators.

Setting Machine Communications' Properties

Click on the Communications' Tab:



Settings:

- **Baud Rate:** Drop down-list present the various "Speeds". ... 2400, 4800, 9600, 14400, etc. ..
- **Send Width:** Drop down-list present the various "Widths". Width of 7 or 8 are usually used!
- **Send Parity:** Drop down-list present the various "Parity". Ie. None, Even, Odd, Mark, Space!
- **Send Stop Bits:** Drop down-list presents one or two stop bit selections.
- **Send Handshaking:** Drop down-list present the various "Types". Ie. CTS/RTS, XON/XOFF NoWait, XON/XOFF Wait, Both Wait, Both NoWait!
- **Copy Parameters from Another Machine:** If you have a Duplicate Machine Tool you can copy it's parameters to this Machine.
- **Use the same serial port ...:** If your send and receive parameters are the same check this box.

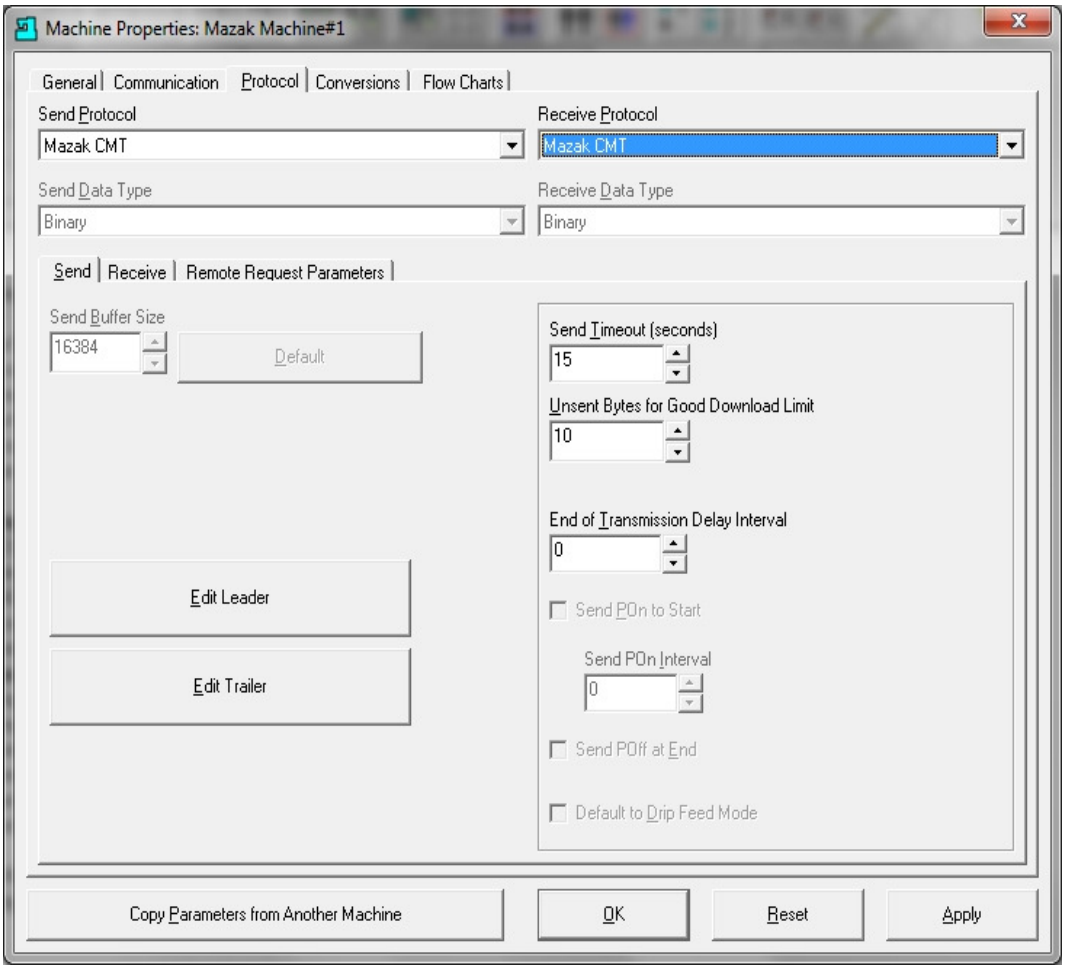
Note: To select the correct settings you will need to see what the Machine Tool Controller Communications Supports and determine at which the Baud Rate you need to operate. You will then need to set the Communication's Parameters in both the Machine Tool Controller and ShopFloorManager.

The settings in the Controller and ShopFloorManager may differ somewhat so we suggest you contact CCI if you have any communication's problems.

In this Example the setting are for a Mazak using the Mazak CMT Protocol which has it's own Handshaking and that is why the Handshaking drop down-list is grayed out.

Setting Machine Send Protocol Properties

Click on the Protocol/Send Tab:



Settings:

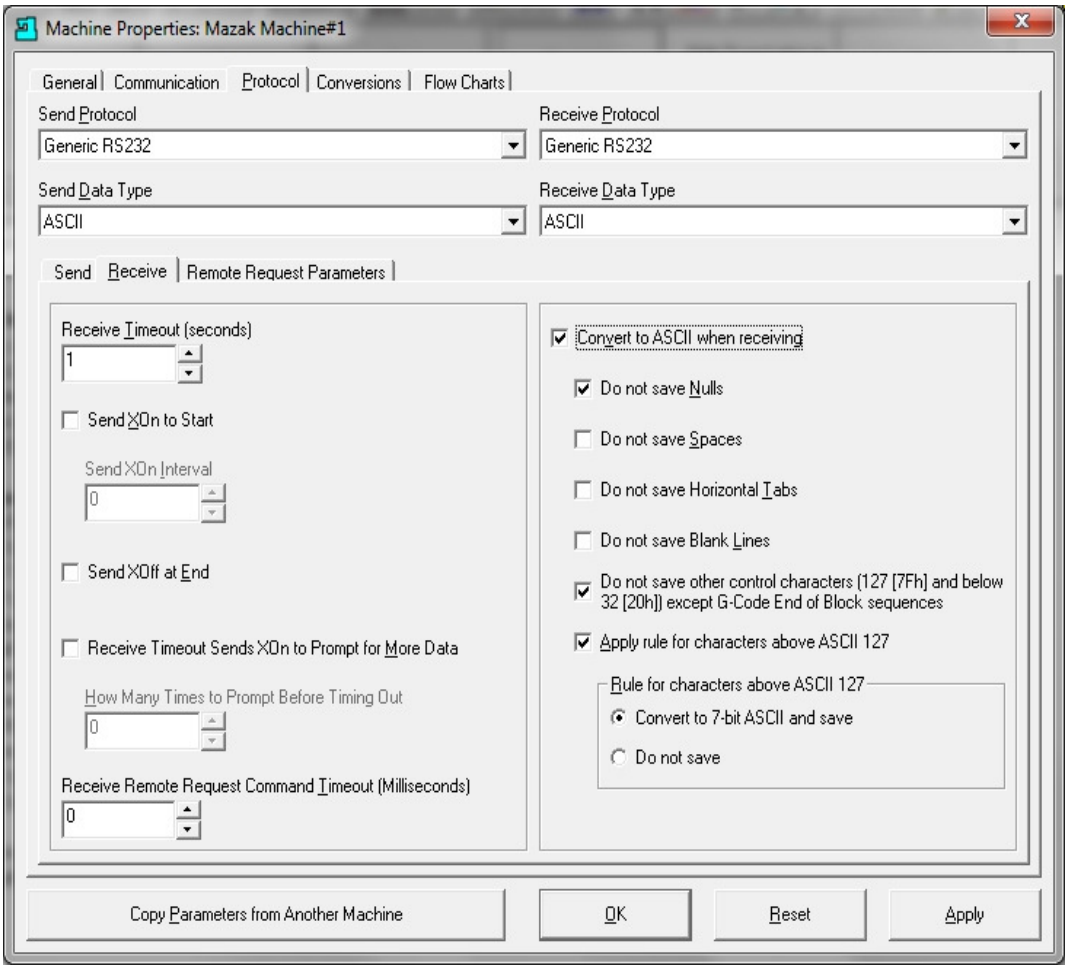
- **Send Protocol:** Drop down-list present the various "Protocols". ... Cincinnati L, Generic RS232, Hurco, Mazak, etc....
- **Send Data Type:** Drop down-list present the various "Data Types". ... ASCII, EIA, Binary, etc....
- **Send Tab**
    - **Send Buffer Size:** This sets the size of the Send Buffer and should not be changed!
    - **Edit Leader/Trailer:** This is not used in new controllers and should not be Edited!
    - **Send Timeout:** Technical - This value should not be changed!
    - **Unsent Bytes for Good Download Limit:** Technical - This value should not be changed!
    - **End of Transmission Delay Interval:** Technical - This value should not be changed!
    - **Send POn to Start:** Technical - This value should not be changed! Needed on some old Machines
    - **Send POff at End:** Technical - This value should not be changed! Needed on some old Machines
    - **Default to Tape Mode** If you are always running in Tape Mode check this box. Ie. Drip-Feed Mode!

Note: Most of the above values have been set based on years of experience and should not but changed. Most Modern Controllers that are RS232 Based will use the Generic RS232 with the various parameter settings mentioned previously.

If you are using an Ethernet or FTP select this from the list of supported Controller types and parameters not required will be grayed out. There are other non-standard protocols also supported. Ie. Mazak CMT, etc.

Setting Machine Receive Protocol Properties

Click on the Protocol Receive Tab:

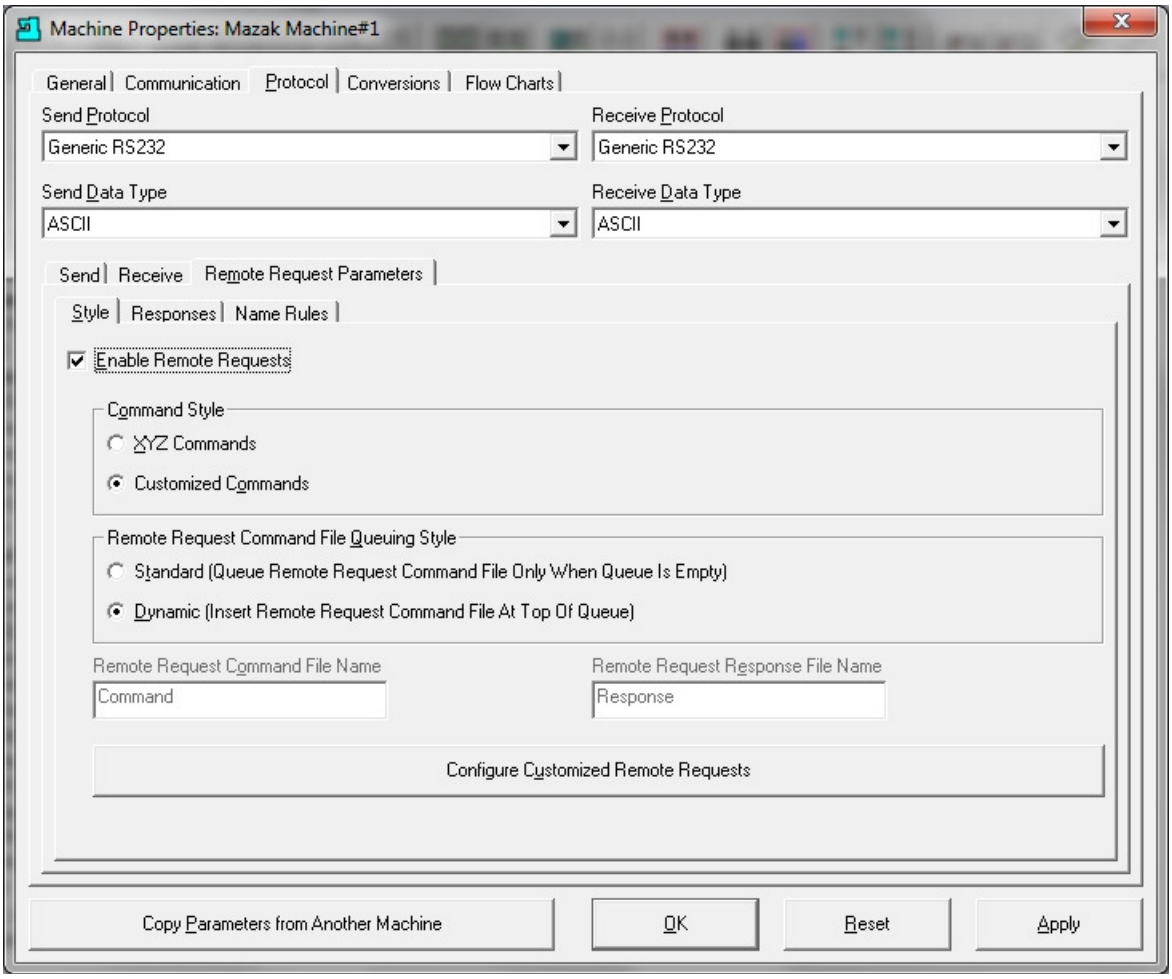


Settings:

- **Send Protocol:** Drop down-list present the various "Protocols". ... Cincinnati L, Generic RS232, Hurco, Mazak, etc....
- **Send Data Type:** Drop down-list present the various "Data Types". ... ASCII, EIA, Binary, etc....
- **Receive Tab**
    - **Receive Timeout:** Technical - This value should not be changed!
    - **Send Xon to Start:** Technical - This value should not be changed!
    - **Send Xoff at End:** Technical - This value should not be changed!
    - **Receive Timeout Sends XOn to Prompt for More Data:** Technical - This value should not be changed!
    - **Receive Remote Request Command Timeout:** When a Machine Tool outputs a Remote Command to ShopFloorManager, ShopFloorManager needs to know when it is safe to assume it has received the complete Command. Since these Commands can have delays during transmission this time delay is used to determine when to assume that it has received the complete Remote Command.
      Note: Since Machine Tool Macro's can send out Remote Commands there can be slight delays during the transmission and setting this Time Delay takes those delays into account. In general once this is set don't change the value!
    - **Convert to ASCII when receiving:** Check this Check-box if your Machine Tool outputs non-standard characters when uploading files. Call CCI if you end up with strange characters in your uploaded files!

Setting Machine Remote Request Protocol Style Parameters

Click on the "Protocol Remote Request" Parameters Style Tab:



Settings:

- **Style:**
    - **Enable Remote Requests:** Check this Check-box if you wish to interact with ShopFloorManager directly from the Machine Tool by sending a Dummy DNC File with Remote Commands embedded in Comment Lines. These Remote Commands can include request for up and downloading of Files, machine events, maintenance events, etc.
        - **Command Style:**
            - **XYZ Commands:** This style is for very old Machine Tools that don't support Comments.
            - **Customized Commands:** This style is for Modern Machine Tools that support Comments.
        - **Remote Request Command File Queuing Style:**
            - **Standard ...:** See explanation in Graphic above!
            - **Dynamic ....:** See explanation in Graphic above!
    - **Configure Customized Remote Requests** See special section on "Configure Customized Remote Requests" or call CCI for help!

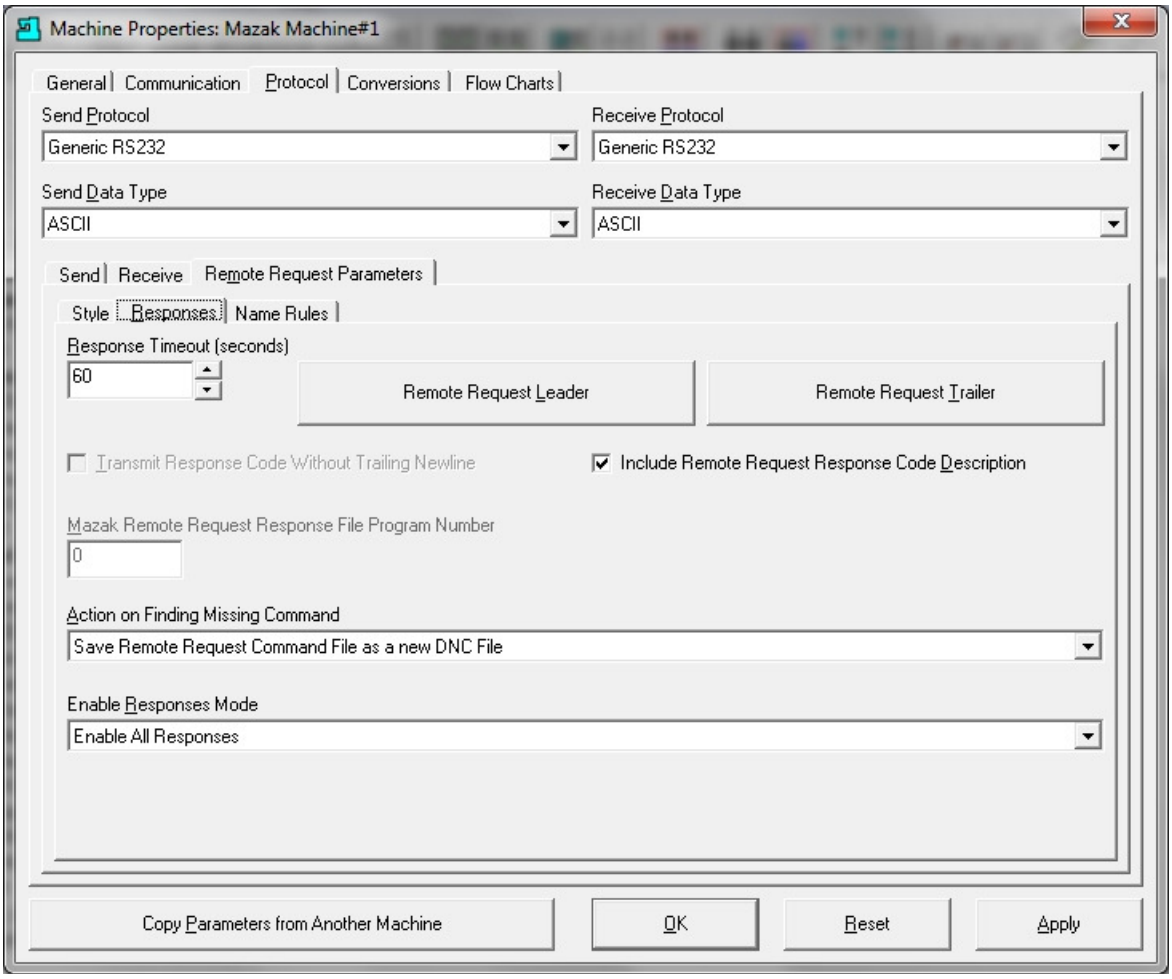
Note: ShopFloorManager allows a Machine Tool Operator to upload a "Dummy DNC File" that can contain Remote Commands to which ShopFloorManager has been configured to recognize and react to. These Remote Commands can consist of: Queuing a file for downloading; Uploading; Queuing a list of files that are available to to this Machine Tool; etc.

These Commands can include Emails, Machine Events, etc. There are 19 Remote Commands which can be individually selected for use and configured for each Machine Tool. If you are also using Machine Events there is not limit to the different "Remote Commands" that ShopFloorManager can support.

See other sections for how to use Remote Commands. If you are using Machine Events in general you should call CCI for help in setting these up.

Setting Machine Remote Request Protocol Responses Parameters

Click on the Protocol Remote Request Parameters Responses Tab:



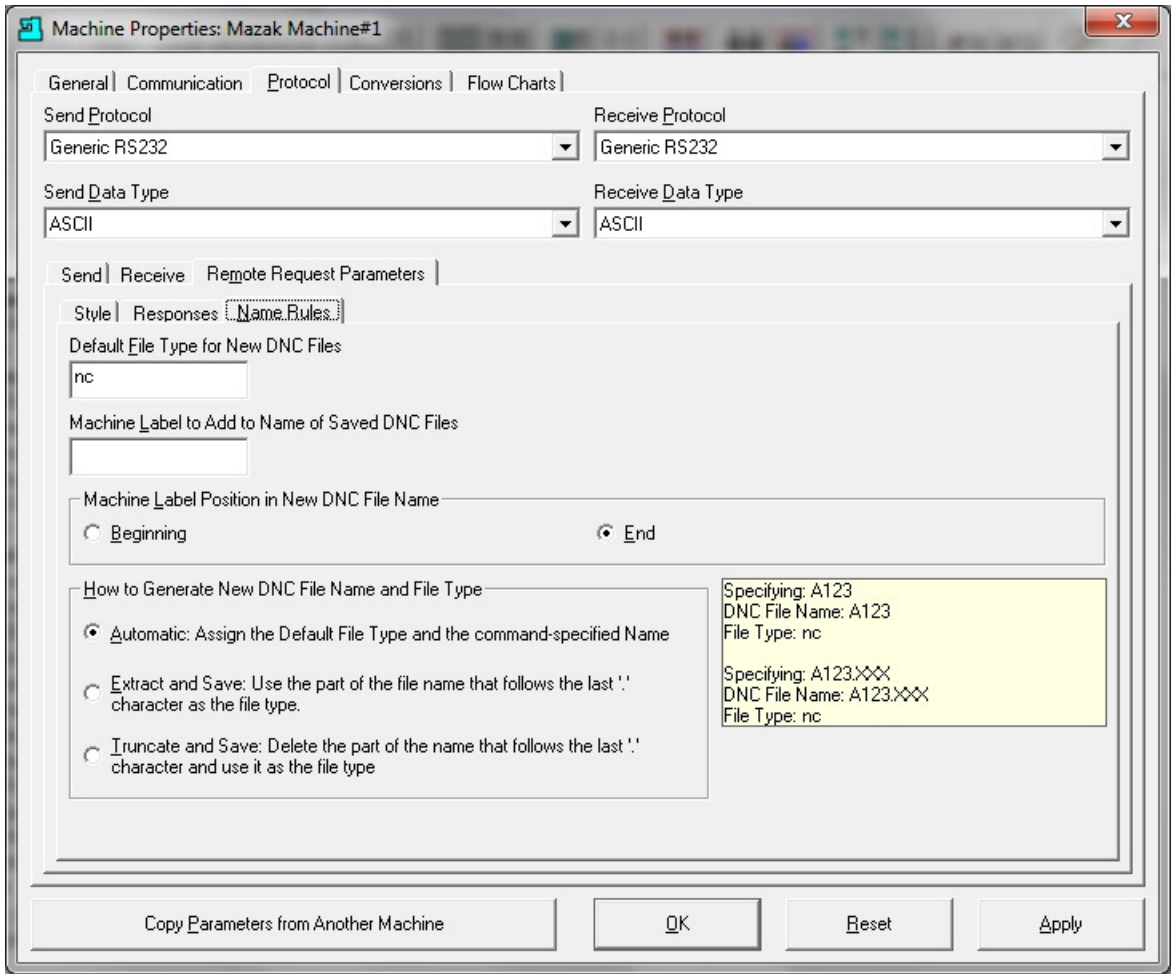
Settings:

- **Response Timeout:** This is the amount of time that a Response File will be held in the Queue before being deleted. ShopFloorManager can inform an Operator at the Machine Tool what the status was of the Remote Command that was last uploaded. If the operator doesn't download this Response File within this set time it is removed from the queue. Setting this to zero means it is never removed from the queue.
- **Remote Request Leader:** You can configure the Beginning Format of Responses for this Machine Tool's Controller. See Section on Configuring Leader & Trailer.
- **Remote Request Trailer:** You can configure the Ending Format of Responses for this Machine Tool's Controller. See Section on Configuring Leader & Trailer.
- **Transmit Response Code Without Trailing Newline:**
- **Included Remote Request Response Code Description:** Includes a more descriptive Response to aid Machine Tool Operators regarding to the Status of the last Remote Command uploaded to ShopFloorManager.
- **Mazak Remote Request Response File Program Number:** Call CCI if you want to use Remote Commands for CMT type Mazak Controllers.
- **Action on Finding Missing Command:** Chose the option that you want. The above option is the safest as it saves anything that comes back from the Machine Tool and can be used for debugging purposes.
- **Enable Responses Mode:** Select Enable or Disable as needed. The above option is the safest.

Note: If ShopFloorManager has been configured to respond to Remote Commands sent from this Machine Tool the above settings allows you to set up the Format(Controller Specific) and other parameters so ShopFloorManager knows how to Respond to these Remote Commands.

Setting Machine Remote Request Protocol Naming Rules Parameters

Click on the Protocol Remote Request Parameters Naming Rules Tab:



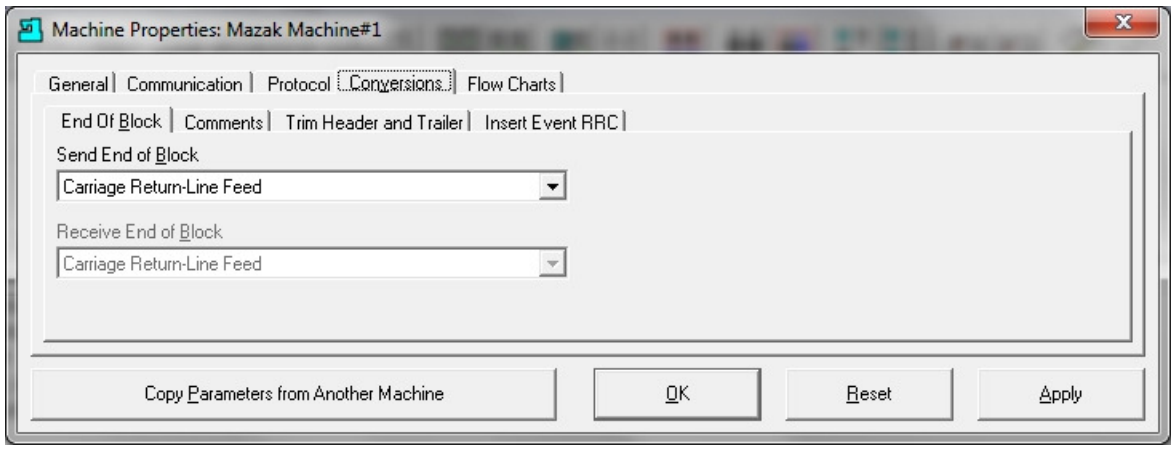
Settings:

- **Default File Type:** When uploading files from the CNC using remote Commands the file type is set to the type in the text-box. Change as needed.
- **Machine Label to Add to Name of Saved DNC Files:** If you want to add a pre-fix or post-fix label to the uploaded file name enter it in the text-box. This could be used to indicate what machine it was uploaded from or to avoid a name collision, etc.
- **Machine Label Position in New DNC File Name:** Set Pre of Post fix position option.
- **How to Generate New DNC File Name and File Types:** Select and option from below. For details look at text Window to the right!
    - **Automatic:** Assign the Default File Type and the Command-specified Name.
    - **Extract and Save:** Use the part of the file name that follows the last "." character as the file type.
    - **Truncate and Save:** Delete the part of the name that follows the last "." character and use it as the file type.

Note: ShopFloorManager supports a myriad of remote command options of which several can be used for naming files that are uploaded remotely. These "Naming Commands" can be embedded in the File during creation and when an operator uploads these files to ShopFloorManager they will be parsed and automatically named based on the parsed embedded command.

Setting Machine Conversions End-Of-Block Parameters

Click on the Conversions End-Of-Block Parameters Tab:



Settings:

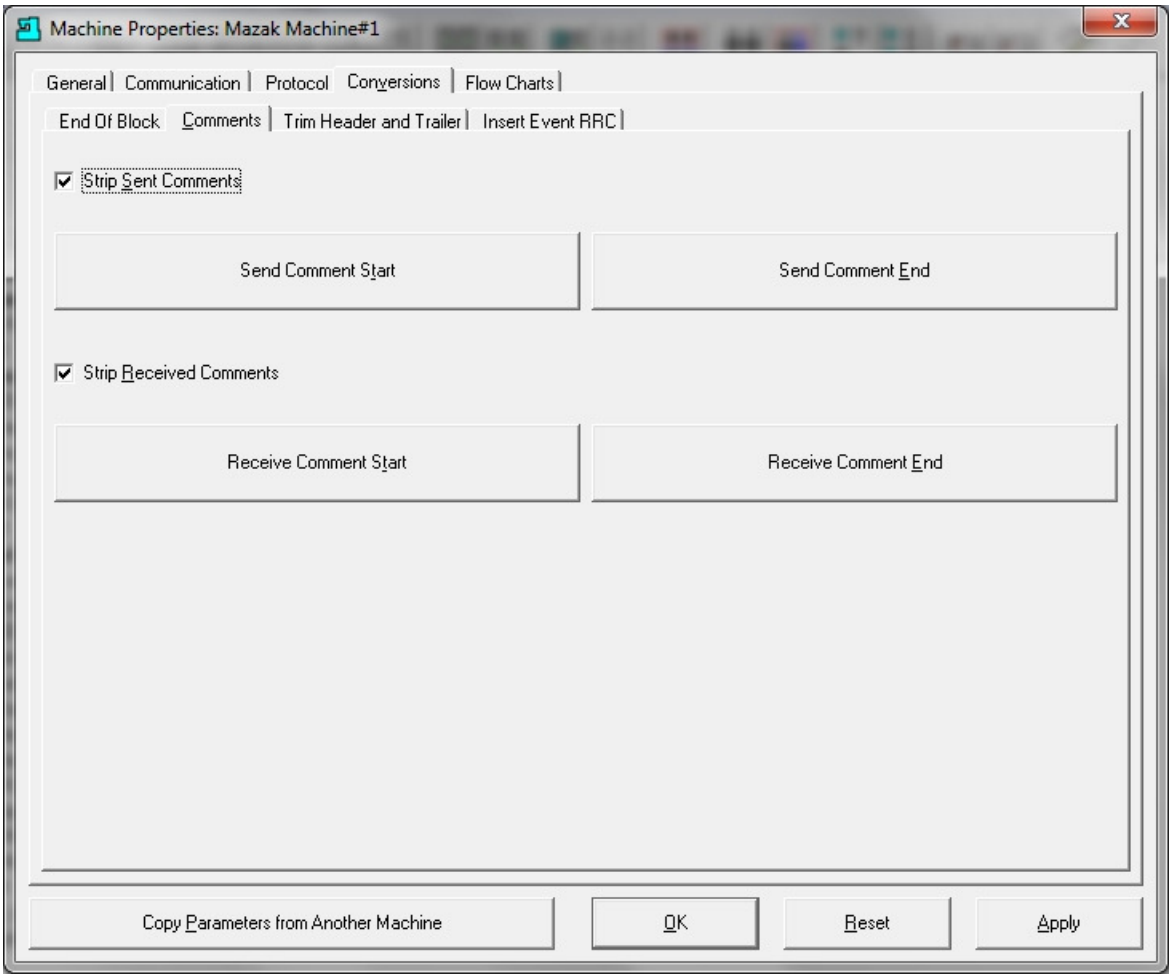
- **Send End of Block:**
    - **None:**

- **Carriage Return:**
- **Line Feed:**
- **Carriage Return-Line Feed:**
- **Line Feed-Carriage Return:**

Note: In general "Carriage Return-Line Feed" is used in all Modern Operating Systems so you don't need to change these settings. Call CCI if you are generating Files on Unix or Old DEC Systems.

Setting Machine Conversions Comments Parameters

Click on the Conversions Comments Parameters Tab:



Settings:

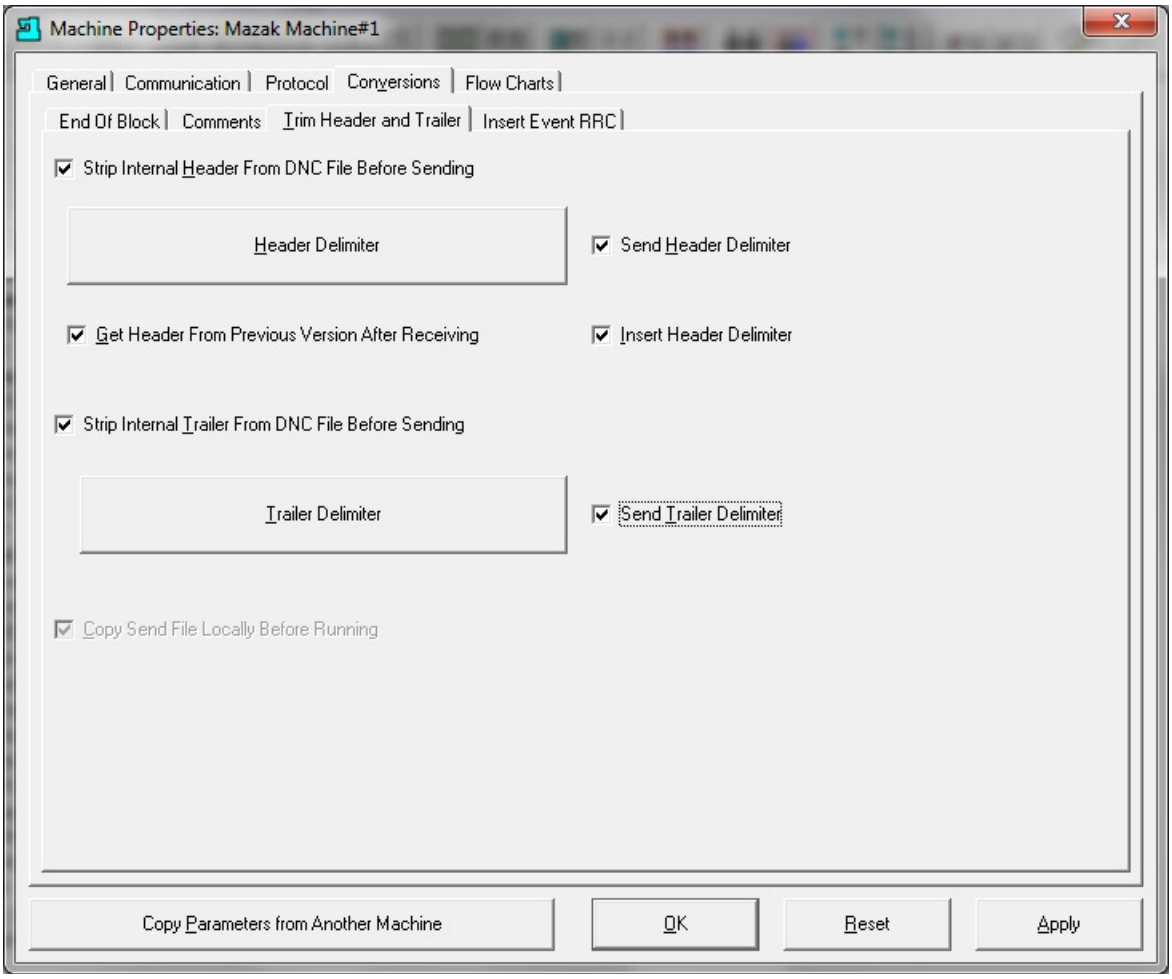
- **Strip Send Comments:** Check the Check-box if you want to Strip Comments sent to the Machine Tool!
- **Strip Received Comments:** Check the Check-box if you want to Strip Comments Received from this Machine Tool!

Note: If you want to strip out comments before they are sent to a Machine Tool or before the uploaded file is saved to ShopFloorManager you will need to check the Check-box and click on the appropriate Button. Clicking on the Button will provide a Window where you can create the Comment Format so ShopFloorManager will know what to delete when sending or receiving DNC Files.

See details on describing the Comment Format in another section of this tutorial.

Setting Machine Conversions Trim Header and Trailer Parameters

Click on the Conversions Trim Header and Trailer Parameters Tab:



Settings:

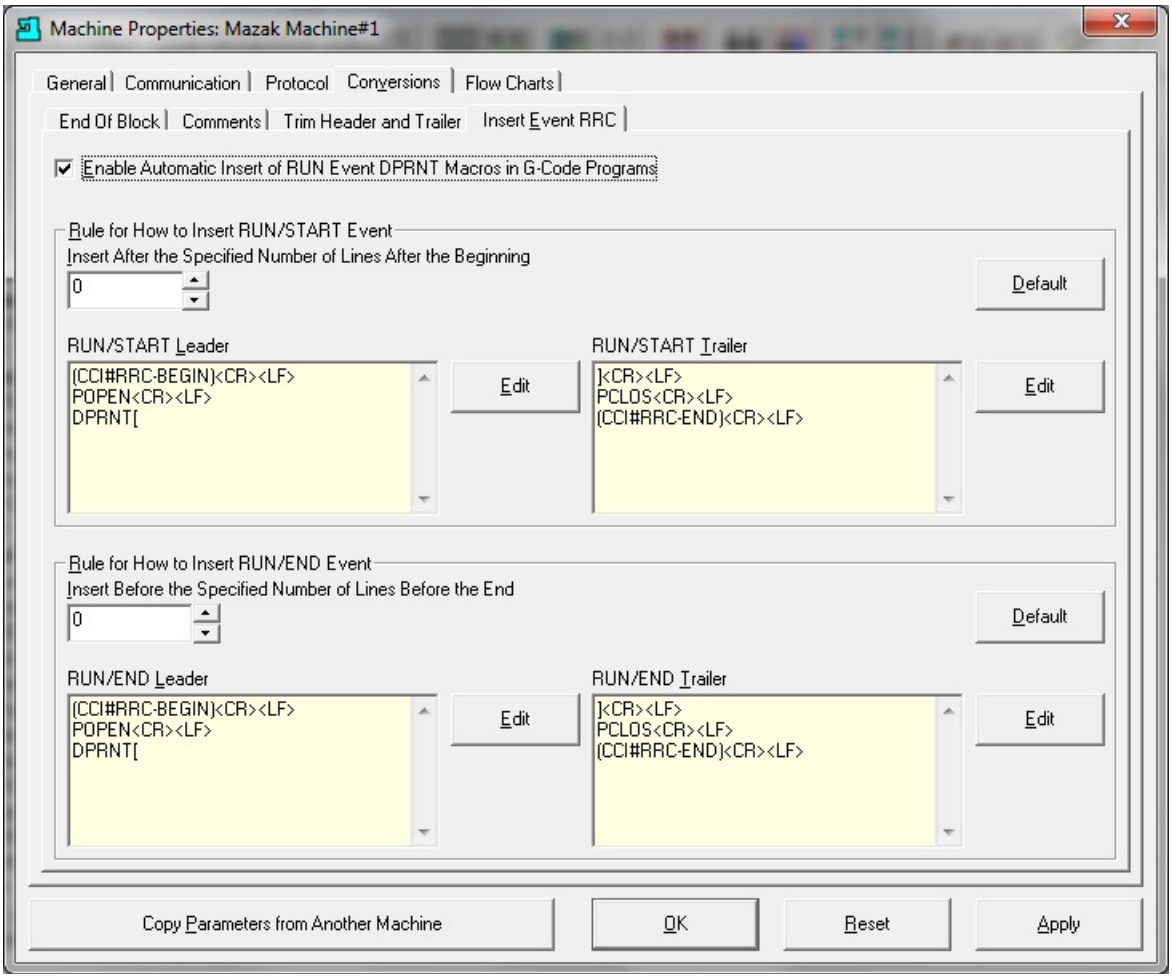
- **Strip Internal Header From DNC File before Sending:** Check the Check-box if you want to Strip Header sent to the Machine Tool!
- **Strip Internal Trailer From DNC File before Sending:** Check the Check-box if you want to Strip Trailer sent to this Machine Tool!
- **Copy Send File Locally before Running:** This tell ShopFloorManager to Copy a Remote DNC File(Ie. File is on Server) to the local computer before running!

Note: If you want to strip out Headers and Trailers before they are sent to a Machine Tool you will need to place check the Check-box and click on the appropriate Button. Clicking on the Button will provide a Window where you can create the Trailer & Header Format so ShopFloorManager will know what to delete.

See details on describing the Header & Trailer Format in another section of this tutorial.

Setting Machine Conversions Insert Event RRC Parameters

Click on the Conversions Insert Event RRC Parameters Tab:



Settings:

Note: ShopFloorManager allows you to embed DPRNT statements in your DNC Files which will be output through the RS232 port during program execution. Depending on what you place in these DPRNT statements ShopFloorManager can be configured to collect these Events for generating Production & other types of reports.

The above appropriate DPRNT Texts Fields can inserted into you DNC Files after so many lines or so many lines before the End of the program. Remote Commands are placed inside the DPRNT[*** data remote command ****] and will be transmitted via the serial port as the program is executed.

The data/remote commands inserted between the DPRNT[**** remote commands ****] brackets can be configured to represent a Start of a Job and an End of Job, etc. When ShopFloorManager receives these commands through the serial port it parses these and appropriately records Start & Ends Times.

If you elect to use these in your DNC Files these can be automatically inserted using the "Transform" Menu from the "Manage DNC File" Window. Call CCI for details if you need help.

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