



Application Engineering Dept.
API Applications Development

Application Name : Part Flip Monitor

Purpose: to reduce mistakes when a part flip process is used

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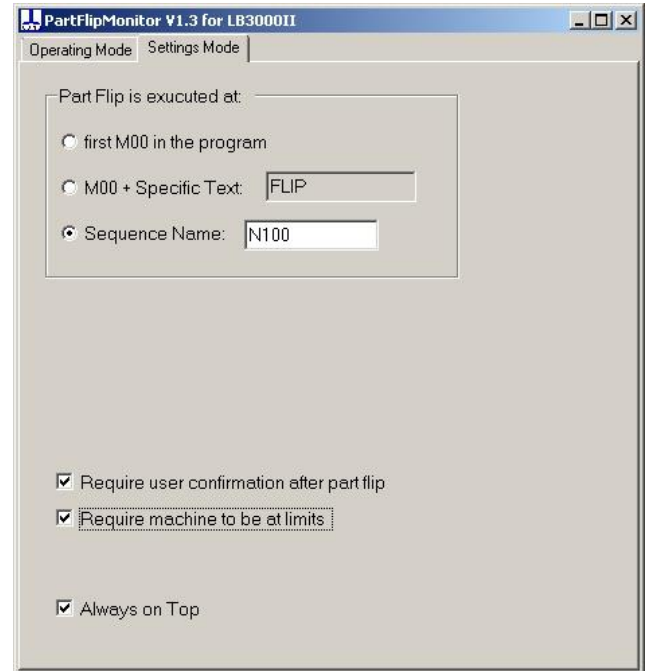
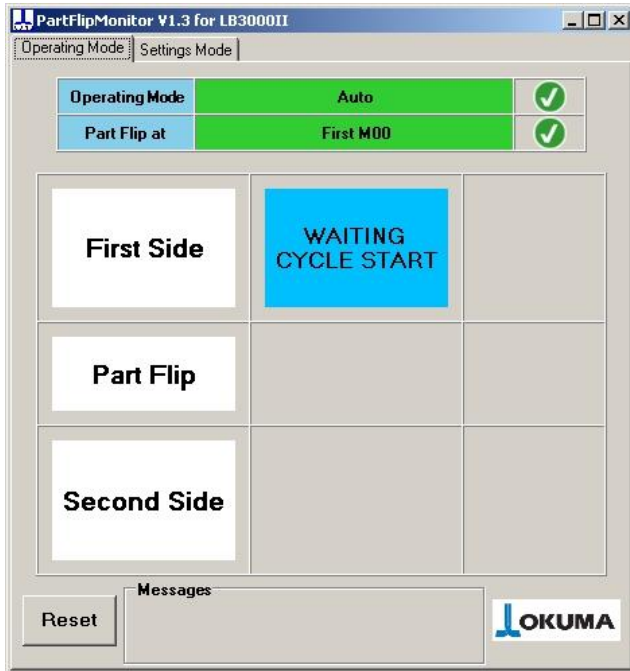
Version: 1.3

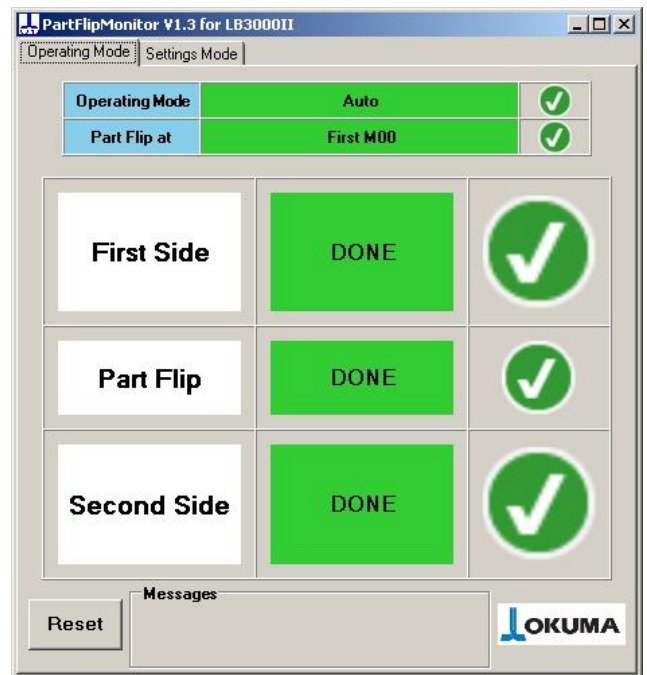
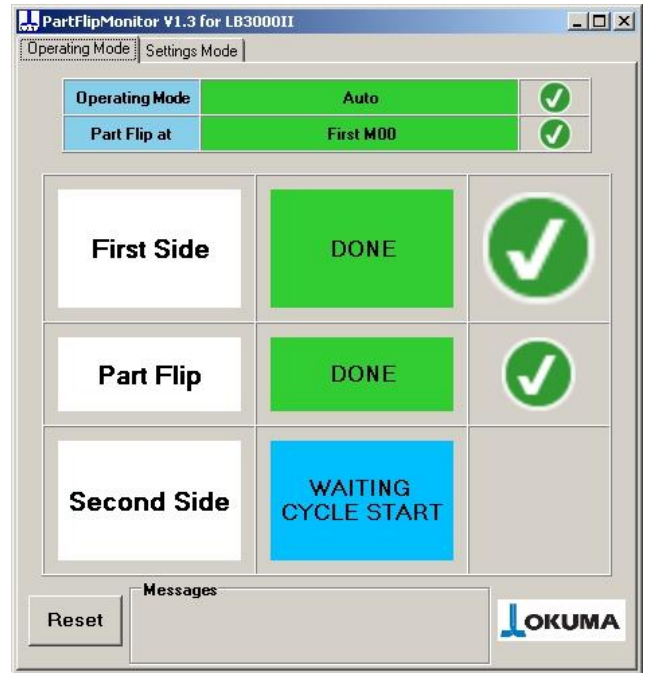
Status : released

Requirement : Okuma OSP P200 minimum control

Okuma OSP API ver. 1.12.0 or newer installed on the CNC

Microsoft .NET framework 4.0





1. Application specifications

- *Works for Lathes (main spindle only) and Machining centers*
- *Clearly shows from distance the machine status: first/second side running, part flip needed or part completed. Useful if the operator runs more than one machine at a time.*
- *Choose between two operating modes: operator confirmation by pressing a button or automatically sensing the part unclamp/clamp.*
- *If the turret is not at the limits, the cycle start will be disabled. This functionality can be disabled and the application will not check for the turret to be at the limits.*
- *For Machining Centers, the operating mode is by operator confirmation only.*
- *The program block that identifies the part flip can be specified in three ways: at the first M00 in the program, at any M00 with a comment, or at a specific sequence number.*
- *No changes in the part program are required.*
- *The user settings are preserved between the application runs.*
- *Automated installation and removal of the application.*
- *The installation wizard detects if the .NET framework 4.0 is not present on the target machine and prompts the user to install it if needed.*

2. Application Installation



After downloading the application from the Okuma App Store, run 'Setup_OkumaPartFlipMonitor.exe, click 'Next >' to go through the installation wizard and have the application installed. For subsequent application starts, simply open to the start menu and look for the 'Okuma Part Flip Monitor' program group. The uninstall application can be found in both the control panel (Add/Remove application) and the start menu under 'Okuma Part Flip Monitor'.

If the application installer or uninstaller is executed when the application is already running, a message informs that the application must be closed. Simply close the **Okuma Part Flip Monitor** application by clicking on the red X button on the top right corner, and run the uninstaller again.

3. Minimum Requirements

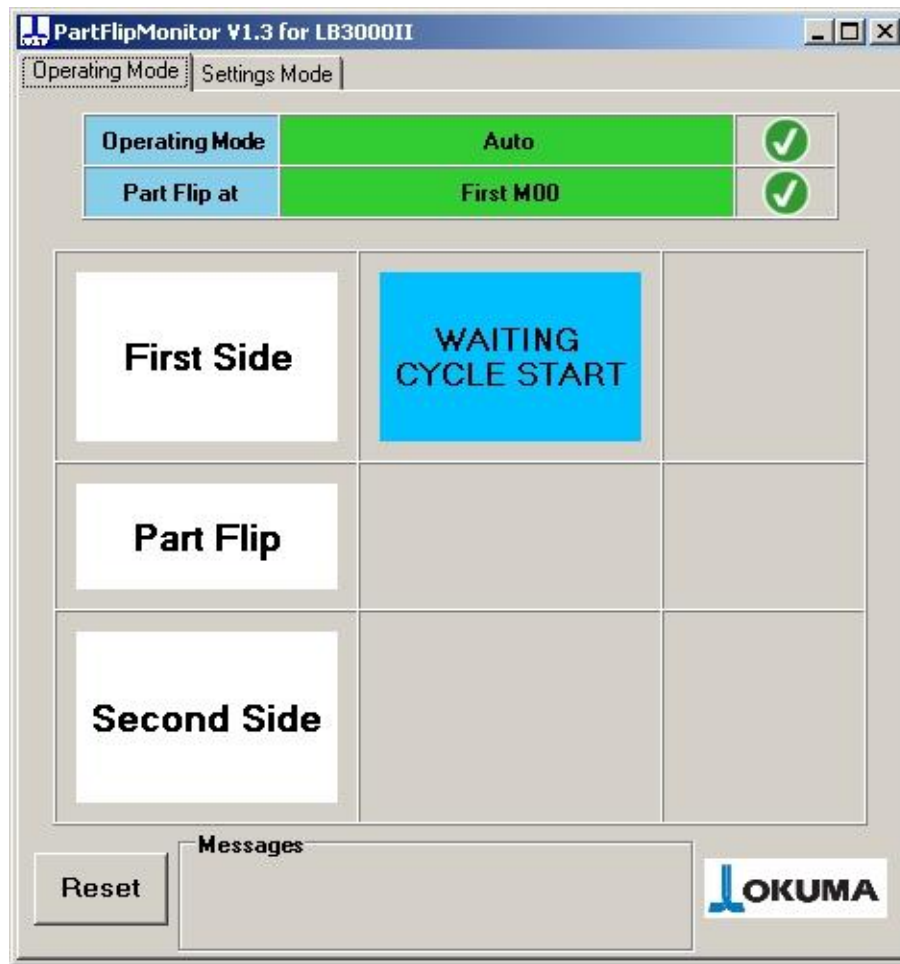
- *OSP Think API 1.12.0 or greater: click on the API icon in the tray (next to date and time), a window will pop up showing which version of the API is currently running. If the version is less than 1.12.0, please contact your distributor for obtaining newer API.*
- *.NET framework 4.0 or greater: the setup wizard will check if the proper .NET framework is already installed. If not, a message box will show up during the application installation process, informing to run 'dotNetFx40_Full_x86_x64.exe'. Simply press OK to dismiss the dialog box and run 'dotNetFx40_Full_x86_x64.exe' from the application archive. When the .NET framework installation is completed, re-run the application installer.*

4. Operating workflow

To successfully run the Part Flip Monitor with any part program follow these steps:

- *Make sure the right part program is selected for execution*
- *Run the OSP Part Flip Monitor*
- *Switch to the Settings Mode Tab and properly configure the application:*
 - *Set how the application recognizes the part flip block:*
 - *First M00 in the program*
 - *A combination between M00 and some text in a comment*
 - *A specific sequence number*
 - *Check “Require user confirmation after part flip” if the user must confirm that the part flip is done*
 - *Check “Require machine at limits” if the application has to check for the machine at limits*
 - *Check “Always on top” if you want the application to be always visible.*
 - *If the machine has two spindles, select if the application monitors the left spindle or the right one.*
- *Switch to the Operating Mode tab and make sure that the “Part Flip At” is in green: this means that the application found the part flip condition specified in the Settings Mode tab. If the “Part Flip At” is in red, it means that the Part Flip condition cannot be found: recheck the settings.*
- *The Operating Mode is green when the Automatic mode is selected.*
- *At this point, the application shows “Waiting Cycle Start” next to “FIRST SIDE”*
- *Make sure a new part is properly loaded in the machine and press cycle start*
- *The application shows “RUNNING” next to “First Side” and an animation shows that the machine is running*
- *When the first side is done, the application will wait for the part flip and the cycle start button is disabled during the part flip operation*
- *If “Require user confirmation after part flip” is checked in the settings page, the user must click the yellow button “Part Flip Completed” to enable the cycle start button.*
- *If “Require user confirmation after part flip” is not checked, the application will enable the cycle start after that the part has been flipped (the chuck must be unclamped and then clamped).*
- *The application now shows “WAITING CYCLE START” next to “SECOND SIDE”*
- *Press Cycle Start.*
- *The application shows “RUNNING” next to “SECOND SIDE” and an animation shows that the machine is running*
- *When the second side is done, the application will show that all the operations were completed*
- *As soon as the door is opened and the chuck is unclamped, the application will reset itself to be ready for the next cycle.*

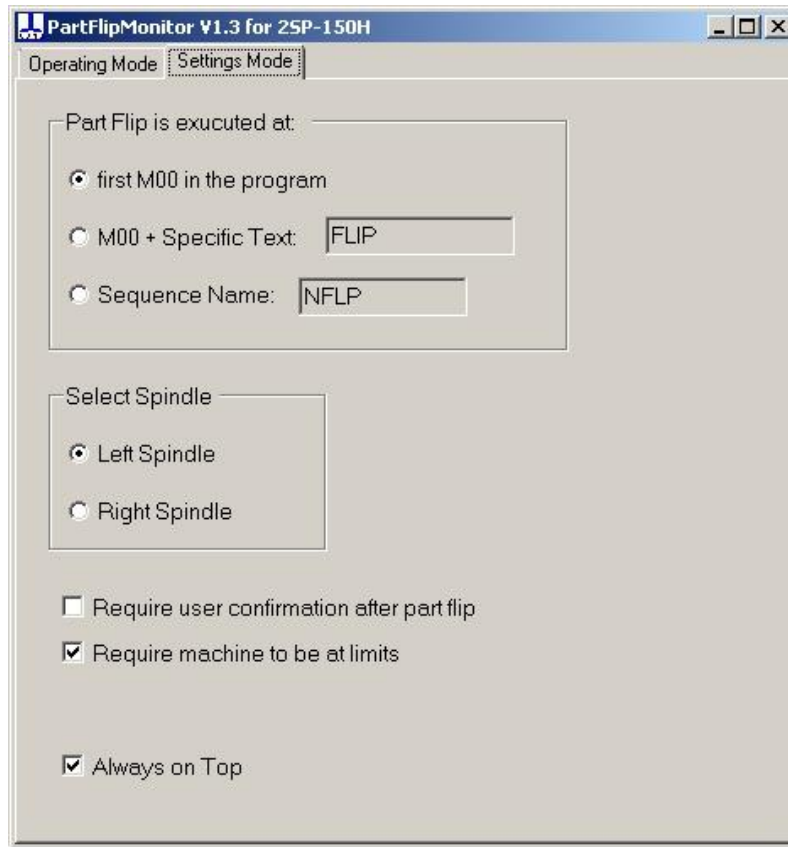
5. The Operation Mode tab



This is how it looks like the application form right after the startup, with the Operation Mode selected; in this case, the machine is in Automatic mode. The top portion shows the machine operating mode and the part flip condition in the program. If the automatic mode is selected and the part flip condition exists in the part program, the application will show green checkmarks and the FIRST SIDE status will show “WAITING CYCLE START”. At this point the application is waiting for the user to press the Cycle Start button, to start the machining of the first side of the part.

The user may need to press the “Reset” button (on the bottom left corner) in case the part program is interrupted by an ‘anomalous’ situation that the application cannot recognize, or the user wants to skip the part flip monitoring for the current cycle. Pressing the application “Reset” button will force the application to stop monitoring the part flip for the current program cycle and restart the normal functioning at the next program start.

6. The Settings Mode tab



This is the setting page where the user can set the part flip condition and various other settings. The application disables this page when the part program is running: the settings can be changed only when the machine is not executing a part program.

6.1 Set the part flip condition

Set how the application recognizes the line of program where the machines stop for the part flip. It can be the first M00 found in the part program or, if there are more than one M00 in the part program, use one of the other two options: a sequence number at the part flip M00 or some text in a comment next to the part flip M00.

6.2 Selected the spindle (for machine with left and right spindle)

The "Select Spindle" group box is shown only with two spindles style machines that have a left and right side and two programs. In this case, the application will monitor only the selected spindle.

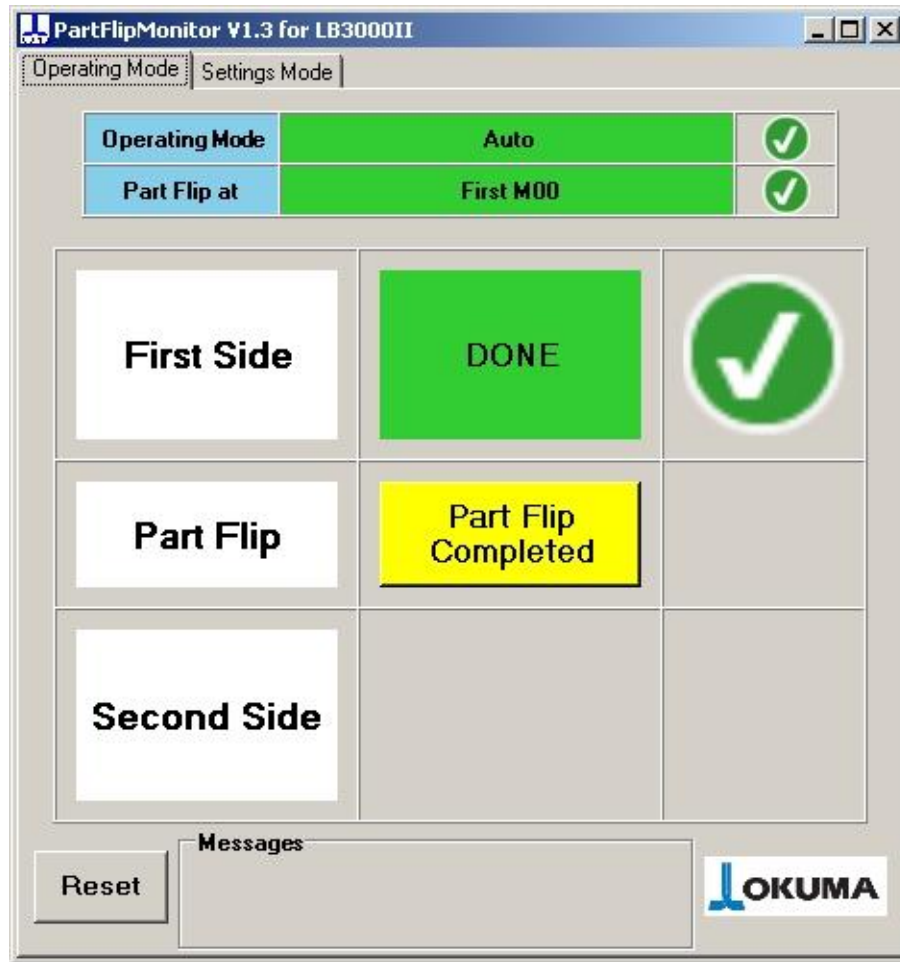
6.3 Other settings

Check 'Require user confirmation after part flip' if you want the user to press a button in order to confirm that the part flip is done. Leave it unchecked to have the application sensing the part flip by the chuck open/close sequence. This setting is available only for lathes; for machining centers the checkbox will be forced to be selected and disabled.

Check 'Require machine to be at limits' if there is the need to have the application checking for the turret to be at the limits before executing a Cycle Start. The application checks for both X and Z limits.

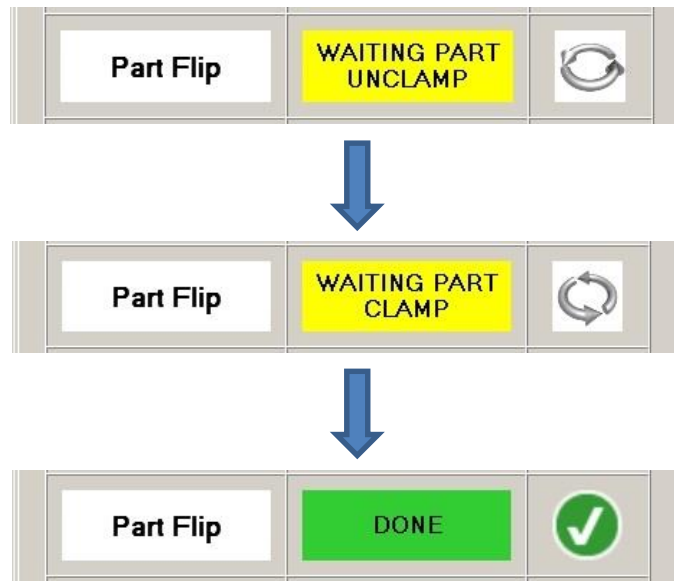
Leave 'Always on Top' checked if you want the application to always be visible.

7. The part flip with user confirmation



When the “Require user confirmation after part flip” is checked in the Setting Mode tab, as soon as the first side is completed the application will disable the Cycle Start and the “Part Flip Completed” button will appear next to “Part Flip”. Once the part is flipped, press this button in order to flag the part flip as done and the application will enable the Cycle Start for executing the Second Side. This is the only mode available when the application is used on machining centers.

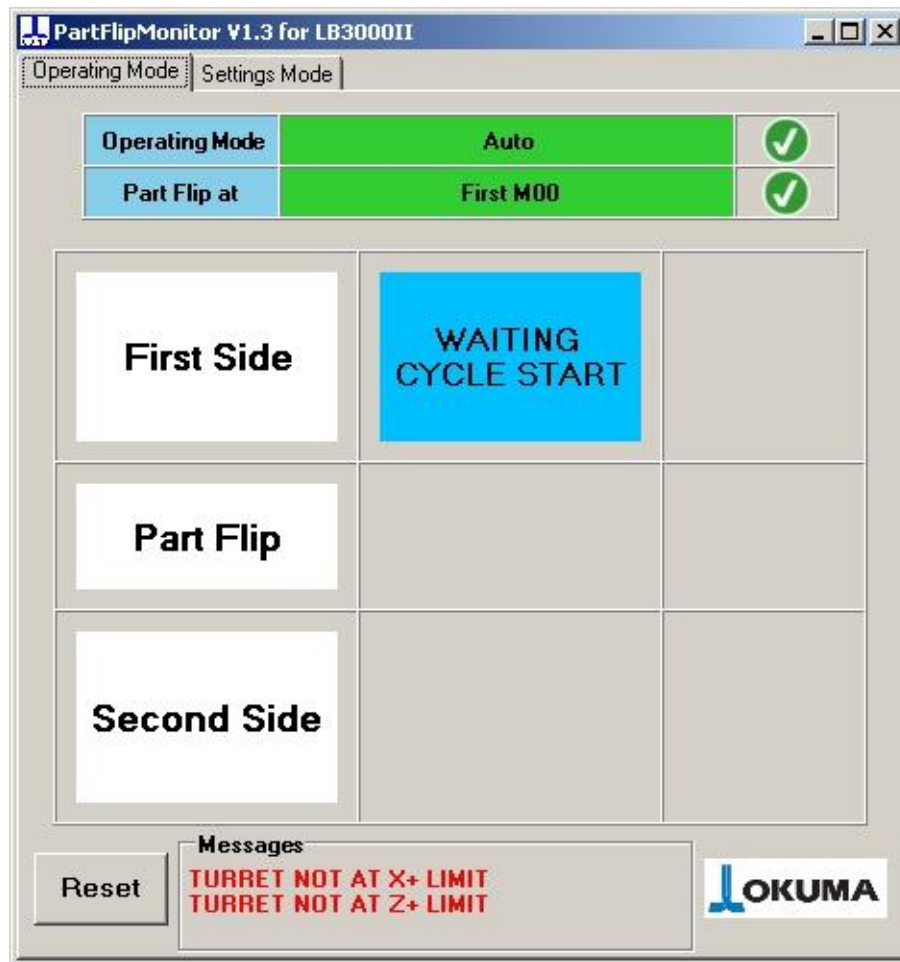
8. The part flip without user confirmation



When the “Require user confirmation after part flip” is not checked, the machine will consider the part flip done when the chuck is opened and then closed. Once the part flip condition is reached, the application will disable the Cycle start and show the message “WAIT PART UNCLAMP”. As soon as the chuck is opened, the message will change in “WAITING PART CLAMP”. When the user has flipped the part and the chuck is closed, the application considers the part flip done and the Cycle Start is enabled, so that the part can be completed.

9. Messages

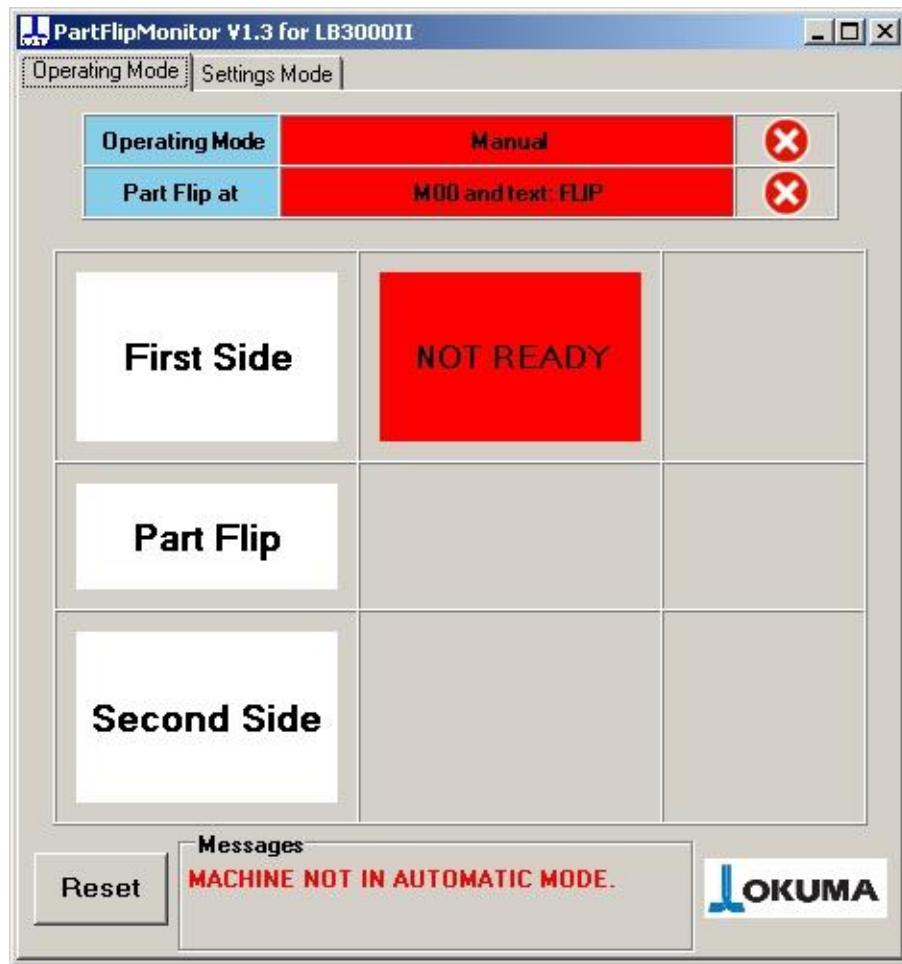
9.1 Turrets limits



When the 'Require machine at limits' checkbox is checked, the application will disable the Cycle Start if the turret is not at the limits. This functionality applies to lathes only by checking the X and Z position of the turret. If the turret is not at the limits, the application will show the message "Turret not at X+ limit" or "Turret not a Z+ limits" or both. For machines with two turrets, the message specifies which turret, A or B, or both, is not at the limits.

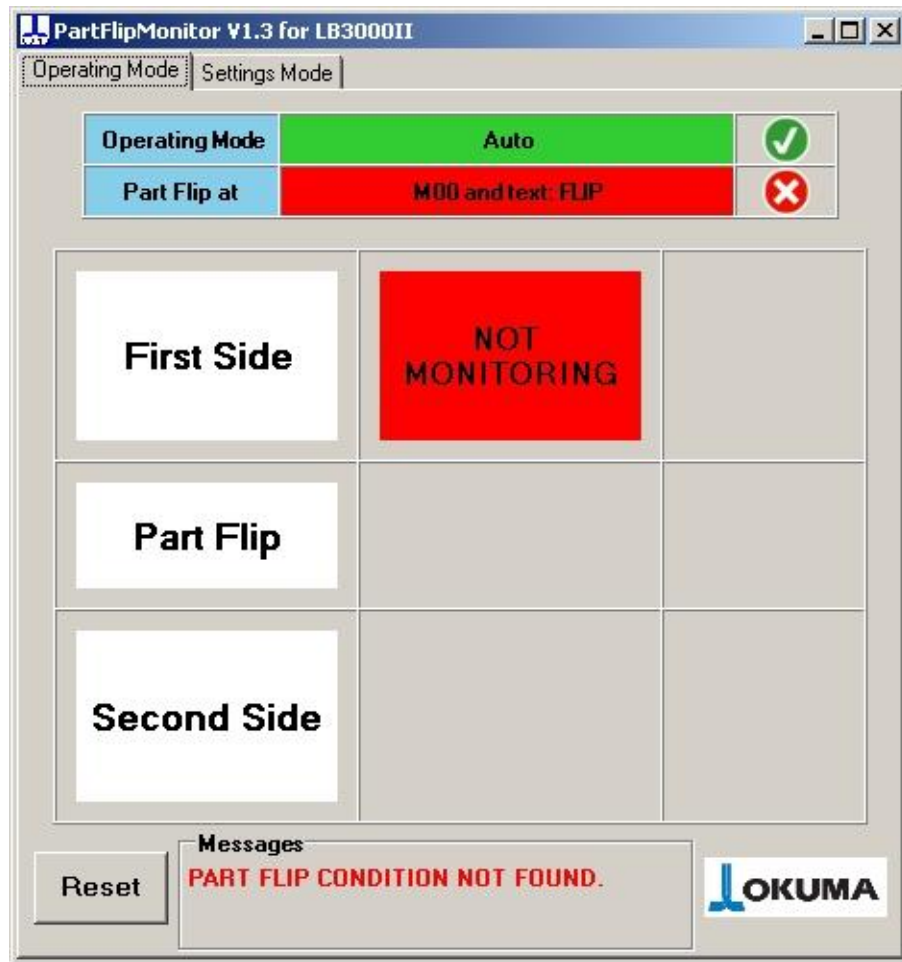
Manually move the turret to the limits so the application will enable the Cycle Start button.

9.2 Automatic mode not selected



When the Automatic mode is not the active operative mode, the application shows the current mode in red along with the “NOT READY” message. This means that the machine is not ready to execute the program. The messages box at the bottom shows that the machine is not in Automatic Mode. In this case, the machine is operative in manual and MDI mode.

9.3 Part flip condition not found



When the machine is in the Automatic mode, but the application cannot find the part flip condition in the program, the red message “NOT MONITORING” indicates that the user can execute the part program, but the application will not monitor the machine activities. The message in the Messages box shows that the application cannot find the part flip condition specified in the settings tabs.

10. Sample program for turret lathes

The installation package includes a part program named "PART-FLIP.MIN" that can be used as a test program for the application or for personnel training purpose. Here is the PART-FLIP.MIN content:

```
G0 T0101 (TURRET INDEXING)
G04 F4. (4 SECONDS DELAY SIMULATING THE FIRST SIDE)

NFLP M00 (FLIP THE PART)

G0 T0303 (TURRET INDEXING)
G04 F4. (4 SECONDS DELAY SIMULATING THE SECOND SIDE)

M02
```

This program is for lathes with one spindle and on turret. It may need extra code if running on a multi-spindle or multi-function lathes.