Mattec Corporation

SPC Analyzer Import/Export

Operator's Manual

MANUAL # 710-0084
REV A

10/13/97

ATTENTION

Please resolve any questions immediately with the MATTEC Customer Service Department.

IMPORTANT MATTEC PHONE NUMBERS

MATTEC Customer Service Department (513) 683-1075

NOTE: All Analyzer System features are described herein. Your installation may not include all these functions due to the software options you purchased.

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1. Introduction

MATTEC Corporation's SPC Analyzer Import/Export feature will transfer data between the SPC Analyzer and a PC.

MATTEC Corporation's SPC Analyzer is a process monitoring and data sample collection device. Various processes can be viewed in both real time and by *Automatic* and *Manual SPC* samples taken during the last 48 hours. Processes are also checked by specification limits on every machine cycle with operator alarms on violations via front panel lights, the *View Process* real time display, the *Process Report* or an alarm output contact.

The SPC Analyzer provides:

- Automatic Mode – Process Data Sampling
- Manual Mode – Process Data Sampling
- Part Weight SQC Data - Variable Data Entry
- Dimension SQC Data – Variable Data Entry
- Part Attribute SQC Data – Attribute Data Entry

Automatic Samples	Process samples taken automatically at present intervals for charting or printing. Samples are checked by X-bar and R limits with alarm on violations via the *Automatic SPC Results* display (reference *Section 7*) for the last 48 hours. Processes can be enabled/disabled on an individual basis.
Manual Samples	These are initiated by the operator and cause process data to be stored for charting or printing. (reference *Section 7*). Samples are checked by X-bar and R limits with alarm on violations via the *Manual SPC Results* display for the last 48 hours (reference *Section 7*). Processes can be enabled/disabled on an individual basis.

The SPC Analyzer offers:

- *Variable* and *Attribute* entry sample collection
- SPC charts for all 13 processes and *Variables*

Variables	Entered by characteristic. Samples are checked by X-bar and R limits.
Attributes	Configured by either P or U type. Samples are checked by P/U limits with alarm on violations via the *Attribute SPC Results* (reference *Section 7*) display for the last 48 hours.
SPC Charts	Available for all 13 processes and *Variables*. Uses the last 48 hours of samples for the enabled SPC processes of the current running job. Available *Charts* are: • X-bar and R • Histogram • Last 100 • Attribute P/U • Pareto Attributes • Injection Profile

Automatic SPC control limit calculations for 13 processes is available on the SPC Analyzer.

The *Job Manager* function of the SPC Analyzer allows two separate jobs to be configured simultaneously at any time. The SPC Analyzer Import/Export program allows data transfer from the SPC Analyzer to a PC running Access 97. This manual describes the functions and features of the Import/Export program.

2. Overview

The SPC Analyzer Import/Export feature will transfer data between the SPC Analyzer and a PC running Windows 95. Data on the PC will be kept in Microsoft® Access tables. The SPC Analyzer Import/Export software allows easy transfer of the data to other systems.

> Note: For users who have purchased Access 97, SPC data stored in the Access tables can be edited through the Access data editing functions.

The program can transfer two (2) types of data in various ways:

- SPC Data (import/upload to PC only)
- Setup Data (import/upload to PC or export/download to Analyzer MIU)

SPC Data	Data collected by the SPC Analyzer. SPC data can be copied from an SPC Analyzer to a PC. Only one job can be uploaded. The Analyzer copies SPC Data for the running job only. If no job is running, information must be input into the Import/Export program as to which Analyzer job to use. If the upload begins and no job is running and none has been specified, the program will assume the data is for Analyzer Job 1 which will then become the "running job". SPC data can be edited by directly editing the Access tables that store the data.
Setup Data	This includes machine set up information such as *job specifications* and *machine configuration*. Setup data can be copied from the SPC Analyzer to a PC, or from the PC to the SPC Analyzer. Setup Data can be edited on a PC. The data will be copied on a job-by-job basis. Job set up data on the PC includes all the Machine set up data. When *Job set up data* is copied back to the SPC Analyzer, the *Machine set up data* will be copied. **Job Setup Data** Part of the SPC Analyzer Setup data. Data specific to a *job*, such as; job and part numbers, lot size, cycle time, SPC enables. **Machine Setup Data** Part of the SPC Analyzer Setup data. Data specific to the *machine*, such as; signal names, enables, formats, and types, printer enables, inject, hold, and back analog stages.

2.1 Reporting

Several sample reports and graphs are supplied with the program. These reports and graphs can be customized by the user.

Four (4) queries have been prepared to view SPC data:

SeeAllAttributeSpcData	View or Edit all the Attribute SPC data
SeeAllAutoSpcData	View or Edit all the Automatic SPC data
SeeAllManualSpcData	View or Edit all the Manual SPC data
SeeAllVariableSpcData	View or Edit all the Variable SPC data

These queries can be customized to copy and edit only needed data. The queries can generate reports or graphs. Data can be generated from these views by using the Windows clipboard or an ODBC interface with the Access 97 driver.

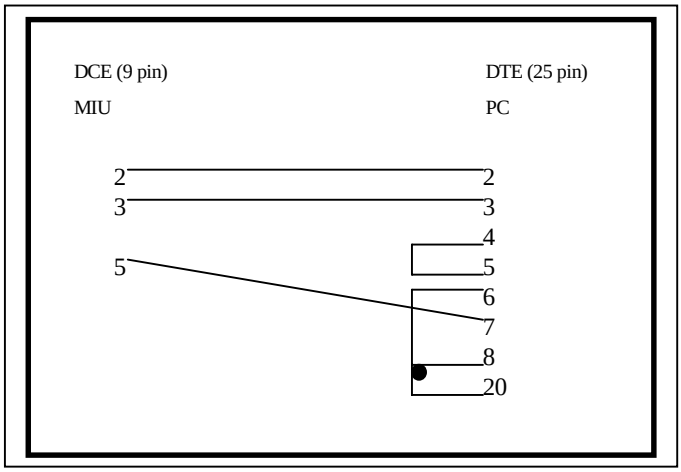
> NOTE: All data is stored as integer data both on the SPC Analyzer and on the PC. The decimal places field provides you a place to specify a divisor for the number. The actual data value should be divided by xxxxx decimal places in the reports you create.

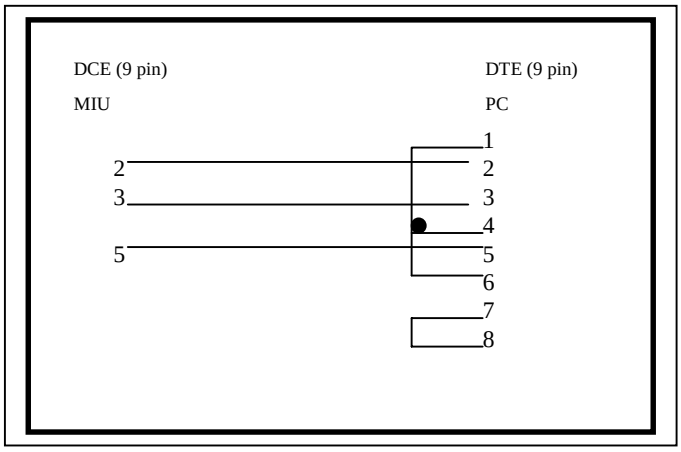
3. Installation Requirements

The SPC Analyzer Import/Export feature requires an SPC Analyzer and a 486 PC or better with Windows 95 or Windows NT operating system. A minimum of 20mb of available hard disk space is required for installation and 16mb of ram is recommended for program execution.

The Import/Export program is a Microsoft® Access 97 program. The installation disk includes a run time version of Access 97 if the user does not have Access 97 on the computer. Access 97 is requirred if the user wants to create custom reports.

A serial cable, configured as shown, is required to connect the comm port of the PC to the comm port of the SPC Analyzer.





3.1 Installation

To install the program, proceed to the Windows 95 Control Panel,
Click: ***Add/Remove Programs***

Insert Disk 1 of the *SPC Analyzer Import/Export* program

Click: *Install*

> *NOTE: During installation a message indicating .ddl files are in use by another application may appear. The files are listed as:*
>
> *comctl32.dll and comdlg32.dll*
>
> ***Press: Ignore***
> *Continue installation*

SPC Analyzer Import/Export feature references the *SPC Analyzer Manual #710-0080*.

If the program is supplied on CD ROM, insert the CD in the drive and run “setup” from the appropriate drive letter.

Click*: Start*
Click: Run
Type: *d\setup* *(if “d” is the CD ROM drive letter)*

4. Getting Started

Once the program has been installed (reference *Section 3*):

Press:

The following screen will display:

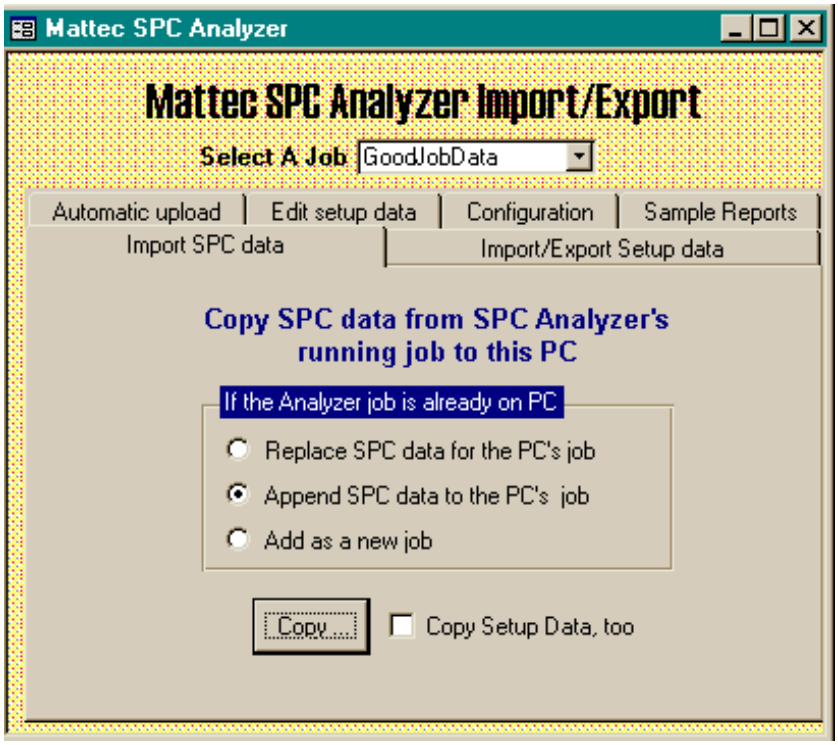


Figure 4-1 SPC Analyzer Import/Export Setup Screen

When the program starts, a screen (Figure 4-1 SPC Analyzer Import/Export Setup Screen) with a tab control box will be displayed. To move from screen to screen, click on any tab.

- Import SPC data
- Import/Export Setup data
- Automatic upload
- Edit setup data
- Configuration
- Sample Reports

All user interaction with the SPC Analyzer Import/Export feature will be done on the PC. The user may upload to the PC the Setup data or the SPC data; or download the Setup data to the SPC Analyzer. The user may also edit the SPC Setup data on the PC. The forms to edit the SPC Setup data will resemble the screens on the SPC Analyzer. The forms may be changed slightly to take advantage of the data entry facilities available with the PC. The user may also edit SPC data by directly editing the Access tables.

The Import/Export function of the SPC Analyzer must be set to "*enable*" (reference *SPC Analyzer Manual #710-0080*). Once Import/Export is enabled, **no user intervention** is required on the SPC Analyzer. A message will be displayed on the Analyzer screen when data transfer begins and ends. The messages are:

- SPC Data transfer started
- SPC Data transfer completed
- Job Setup Data transfer started
- Job Setup Data transfer completed

SPC data and Setup data may be uploaded to the PC while a job is running on the SPC Analyzer. Job Setup data may be downloaded to the Analyzer for a non-running job only.

To begin data transfer:

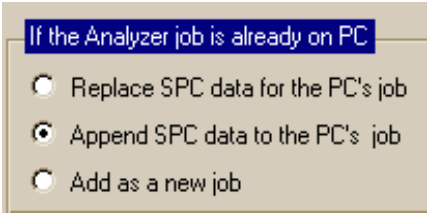
1. Make sure the cable is installed between the SPC Analyzer and the PC.
2. Select one of the following tabs located on Figure 4-1 SPC Analyzer Import/Export Setup Screen.

Import SPC data	Copies SPC data from SPC Analyzer's running job to the PC
Import/Export Setup data	Copies Setup data between SPC Analyzer and PC
Automatic upload	Automatically copies SPC data from Analyzer to PC

The screens associated with these tabs are as follows:

4.1 Import SPC data

Click: ***Import SPC data*** (Figure 4-1 SPC Analyzer Import/Export Setup Screen)

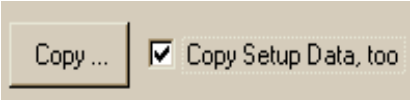


If the SPC Analyzer job is already on the PC, the user has (3) choices on copying data:

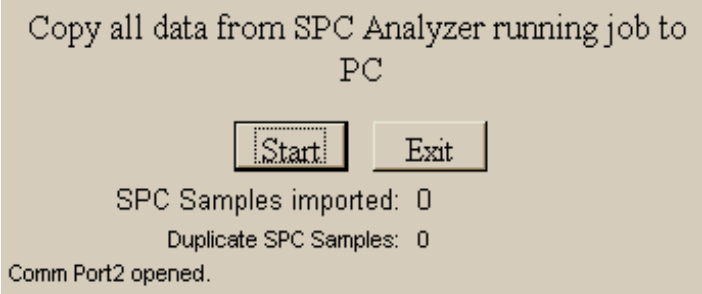
These are defined as:

Replace SPC data for the PC's job	Replaces data for the job already on the PC
Append SPC data to the PC's job	Appends the SPC data on the Analyzer to the job on the PC. If any Analyzer data has timestamps, the same as that already on the PC, the Analyzer data will replace the duplicate timestamp PC data.
Add as a new job	Create a new job for the SPC data with a different job name. This will automatically copy Setup data.

If the following display is √ *checked*, Setup data (reference Section 4.2) will also be copied.



To copy a job:
Press: *Copy*
The following screen will display:



The title describes the data transfer that will be executed.
Press: *Start*

Prompts will display for:

- SPC running job number
- New job name (if applicable)

SPC Samples imported indicates the number of samples being transferred. *Duplicate SPC Samples* indicates samples previously copied to the PC.

4.2 Import/Export Setup data

Click: *Import/Export Setup data*

The following selections must be made:

- Copy from Analyzer to PC (reference Section 4.2.1)
- Copy from PC to Analyzer (reference Section 4.2.2)

4.2.1 Copy from Analyzer to PC

If "*Copy from Analyzer to PC*" is selected, the following screen displays:

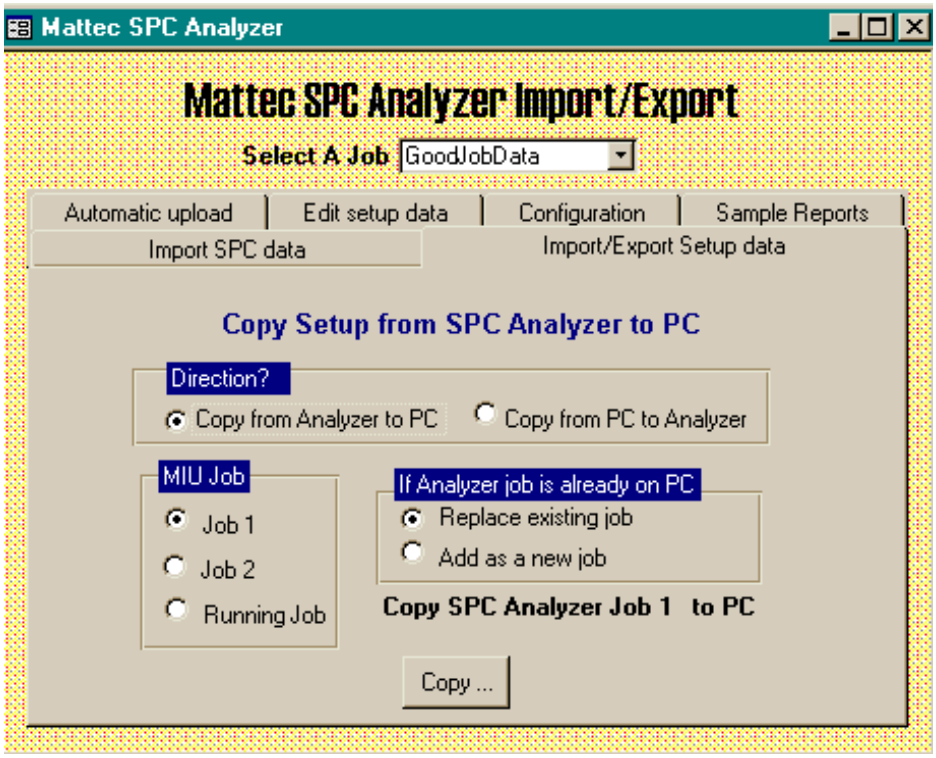


Figure 4-2 Import/Export Analyzer to PC Screen

Select: ***Job 1,*** ***Job 2,*** or ***Running Job*** (which will appear as ***Job 3***) from Analyzer job screen

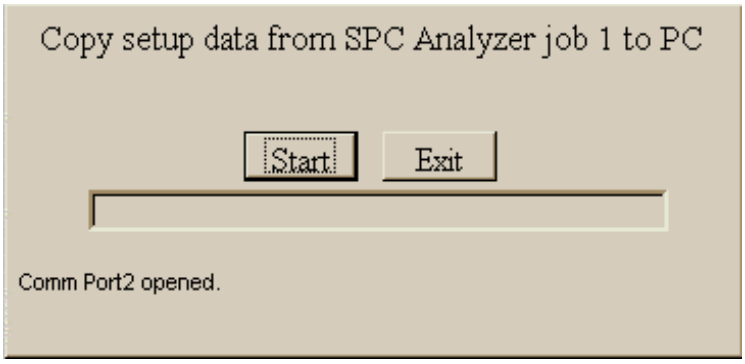
Select: ***Replace existing job*** or ***Add as a new job***

Note the message located in lower right hand corner of screen indicates selection:

Copy SPC Analyzer Job 1 to PC

To copy the job:
Press: ***Copy***

The following screen will display with the information indicating the Analyzer job choice:



Press: ***Start***

The bar located beneath the *Start* and *Exit* buttons indicates the percent of setup data being transferred.

4.2.2 Copy from PC to Analyzer

If "*Copy from PC to Analyzer*" is selected the following screen displays:

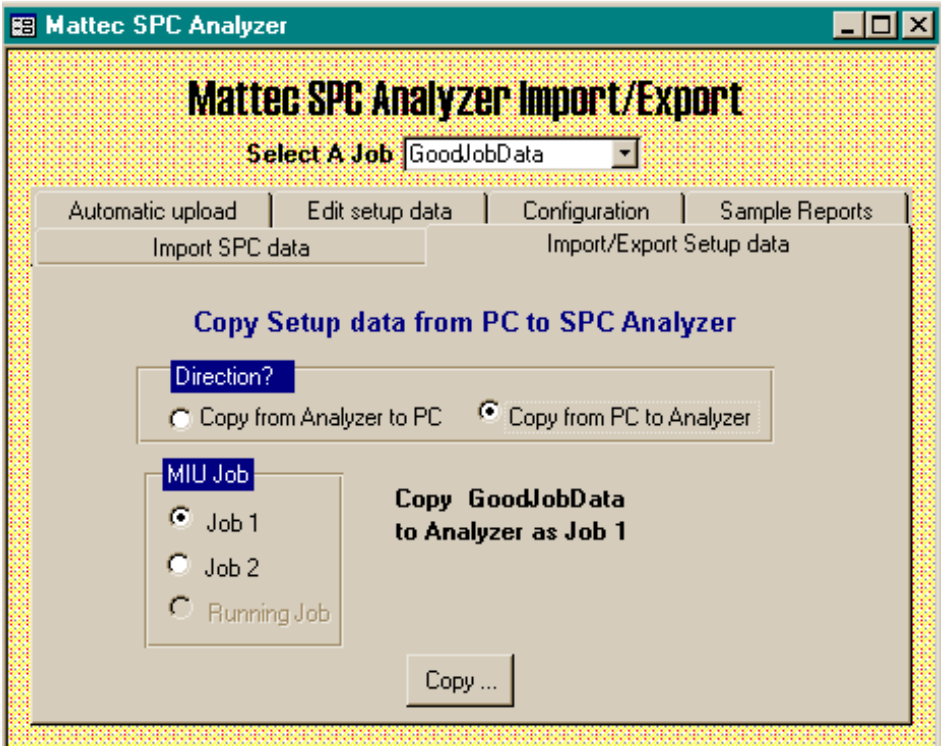
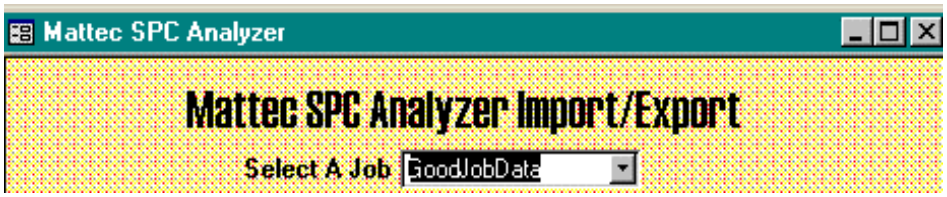


Figure 4-3 Import/Export PC to Analyzer Screen

Select: ***Job 1*** or ***Job 2*** from Analyzer job screen. NOTE: *Running job* has now been disabled.

Select a Job from the picklist on the PC.



NOTE: the message located in lower right hand corner of screen:

Copy GoodJobData to Analyzer as Job 1

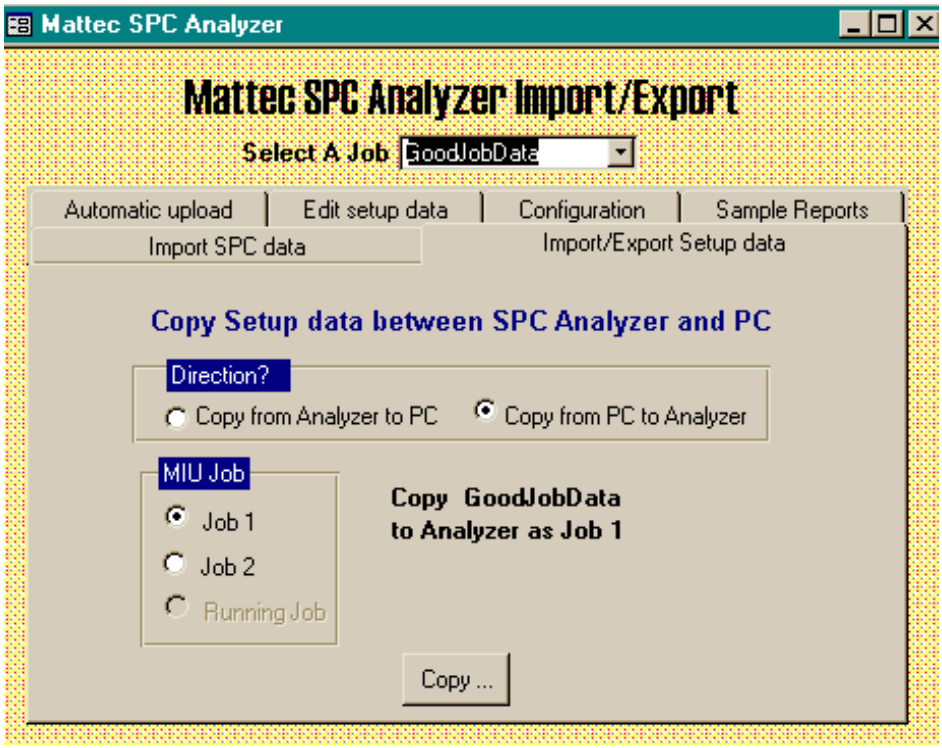
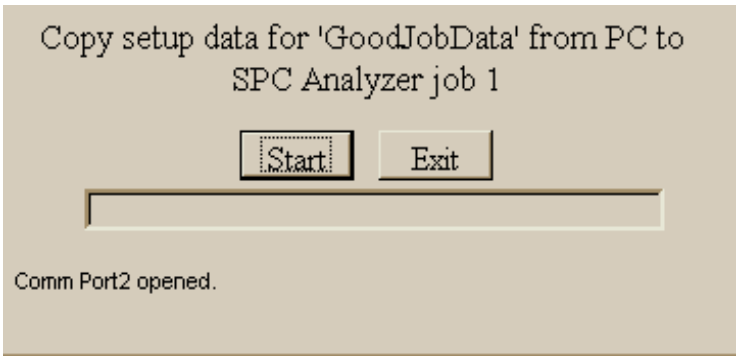


Figure 4-4 Import/Export Setup Data Screen

To copy a job:
Press: *Copy*

The following screen will display:



Press: *Start*

The bar located beneath the *Start* and *Exit* buttons indicates the percent of setup data being transferred.

Prompts will display for:

- New job name (if applicable)

An error message will display if data is copied from a running job.

4.3 Automatic uploads

Click: ***Automatic upload*** (Figure 4-1 SPC Analyzer Import/Export Setup Screen)

The following screen will display:

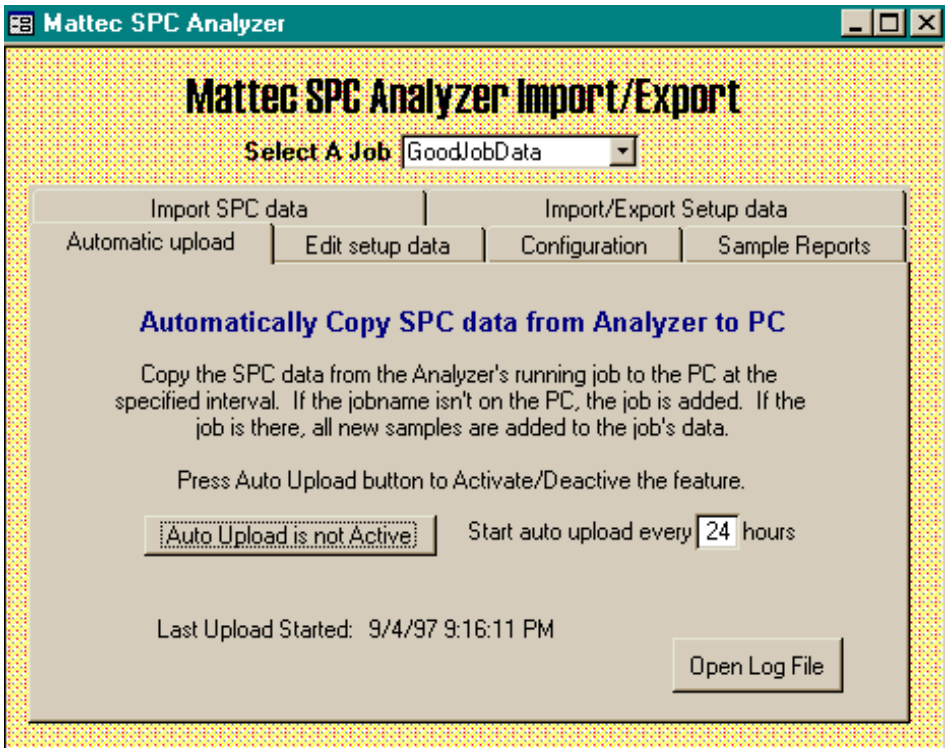
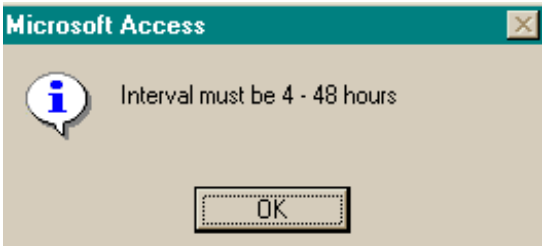


Figure 4-5 Automatic Upload Screen

Information listed on the screen is self-explanatory. The upload will copy SPC data from the running job to the PC. The job and setup data will be added to the PC. It will append all SPC data to any SPC data already showing for the job.

Start auto upload… will designate the number of hours in which to start collecting data. The hours can be changed at anytime.

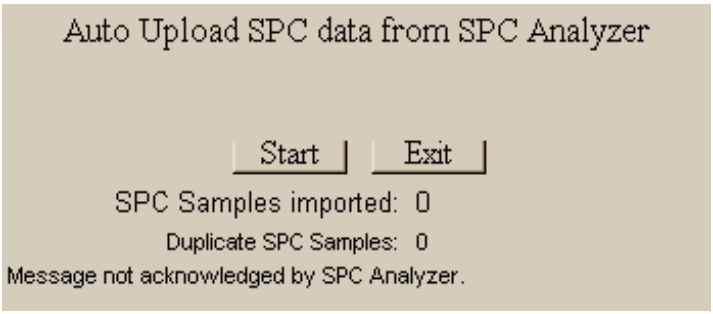
> NOTE*: Start auto upload every hours* cannot accept hours less than (4) four and more than (48) forty-eight. If the number of hours entered falls below or above the specified interval, the following error screen will display when the ***Open Log File*** or ***Auto Upload is not Active*** buttons are pressed:



To activate the screen:

Press: ***Auto Upload is not Active***

The following screen will display:



The title describes the data transfer that will be executed.

SPC Samples imported indicates the number of samples being transferred. *Duplicate SPC Samples* indicates samples previously copied to the PC.

Press: ***Start***

To view data that has been imported/exported:

Press: ***Open Log File***

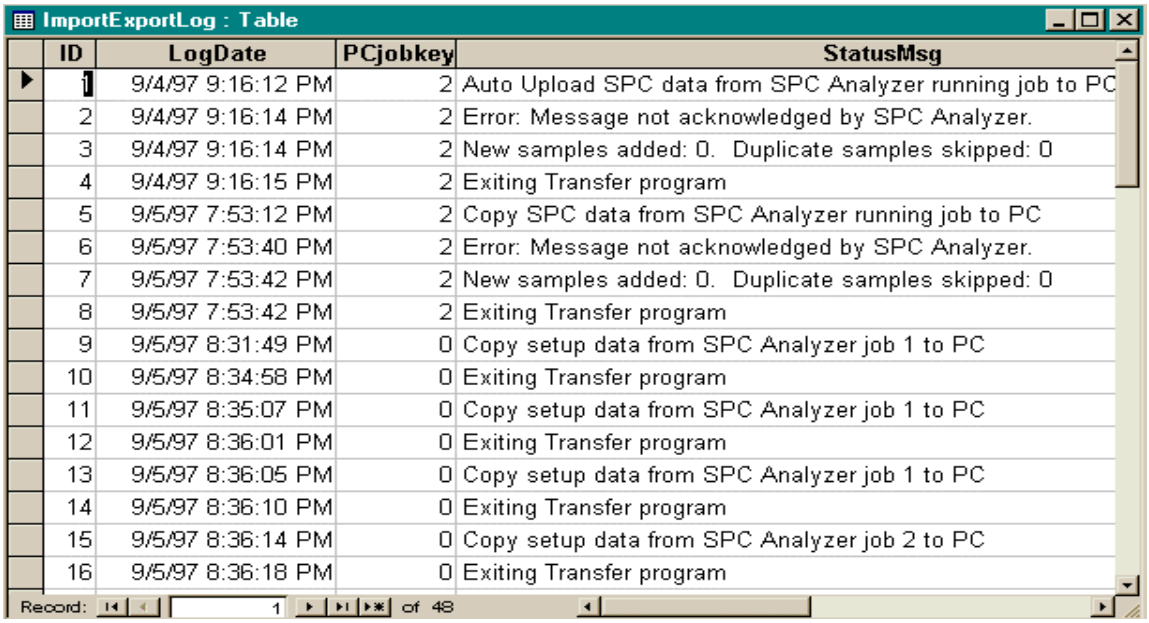
Import/Export transfers are logged to an *Access* table named "*ImportExportLog*".

The import/export log contains:

- Date/time a transfer was started (LogDate)
- Kind of transfer (StatusMsg)
  - SPC or Setup
  - Import or Export
  - Auto or Manual
- Jobs involved (PCjobkey)
- Any errors that occurred (StatusMsg)
- Date/time a transfer stopped (LogDate)

NOTE: records in the log must be deleted on a regular basis

The following screen displays the above information:



ImportExportLog : Table

ID	LogDate	PCjobkey	StatusMsg
1	9/4/97 9:16:12 PM	2	Auto Upload SPC data from SPC Analyzer running job to PC
2	9/4/97 9:16:14 PM	2	Error: Message not acknowledged by SPC Analyzer.
3	9/4/97 9:16:14 PM	2	New samples added: 0. Duplicate samples skipped: 0
4	9/4/97 9:16:15 PM	2	Exiting Transfer program
5	9/5/97 7:53:12 PM	2	Copy SPC data from SPC Analyzer running job to PC
6	9/5/97 7:53:40 PM	2	Error: Message not acknowledged by SPC Analyzer.
7	9/5/97 7:53:42 PM	2	New samples added: 0. Duplicate samples skipped: 0
8	9/5/97 7:53:42 PM	2	Exiting Transfer program
9	9/5/97 8:31:49 PM	0	Copy setup data from SPC Analyzer job 1 to PC
10	9/5/97 8:34:58 PM	0	Exiting Transfer program
11	9/5/97 8:35:07 PM	0	Copy setup data from SPC Analyzer job 1 to PC
12	9/5/97 8:36:01 PM	0	Exiting Transfer program
13	9/5/97 8:36:05 PM	0	Copy setup data from SPC Analyzer job 1 to PC
14	9/5/97 8:36:10 PM	0	Exiting Transfer program
15	9/5/97 8:36:14 PM	0	Copy setup data from SPC Analyzer job 2 to PC
16	9/5/97 8:36:18 PM	0	Exiting Transfer program

Record: 1 of 48

PCjobkey relates to a unique ID for the job stored in the Access table. The PCjobkey is subject to change based on the running job.

To exit this screen either:

Click: 

or

Click: 

which will display a list of options.

4.4 Edit Setup Data

Click: ***Edit setup data*** (Figure 4-1 SPC Analyzer Import/Export Setup Screen)

The following screen will display:

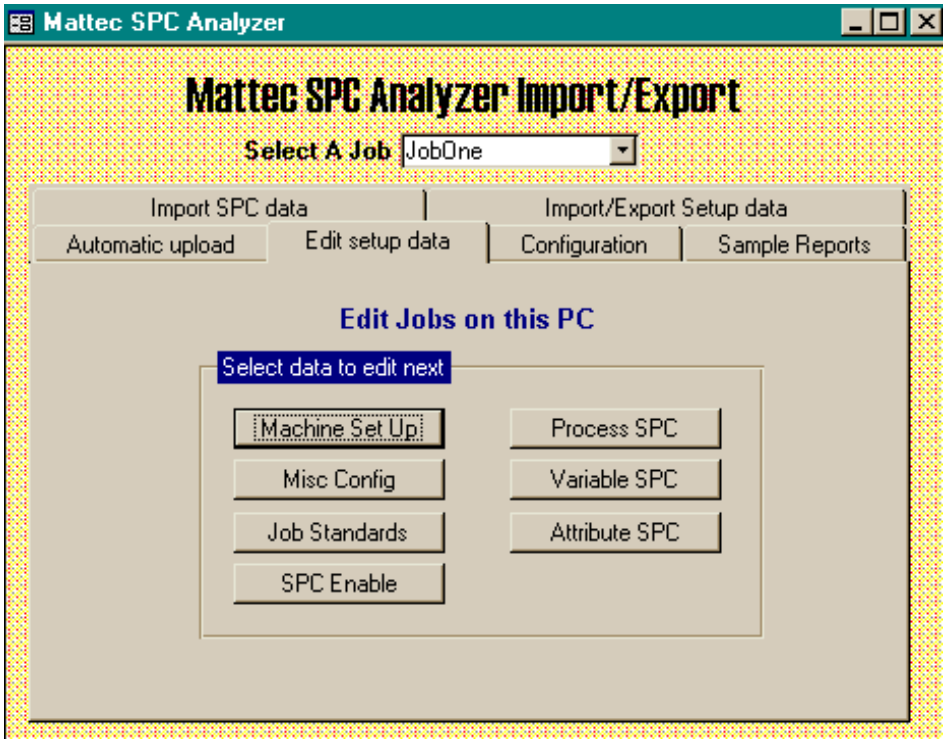


Figure 4-6 Edit Setup Data Screen

Highlight: *a job from the* ***"Select A Job"*** *picklist*

Machine Set Up and *Misc Config* data contain values that are shared by every job. All other data is specific to each job.

> NOTE: Some screens appear with a line next to their title. Such as: Job Standards for _____. Upon entering the ***Job number*** in *the Job Standards* screen, the name of the edited job will appear on this line.

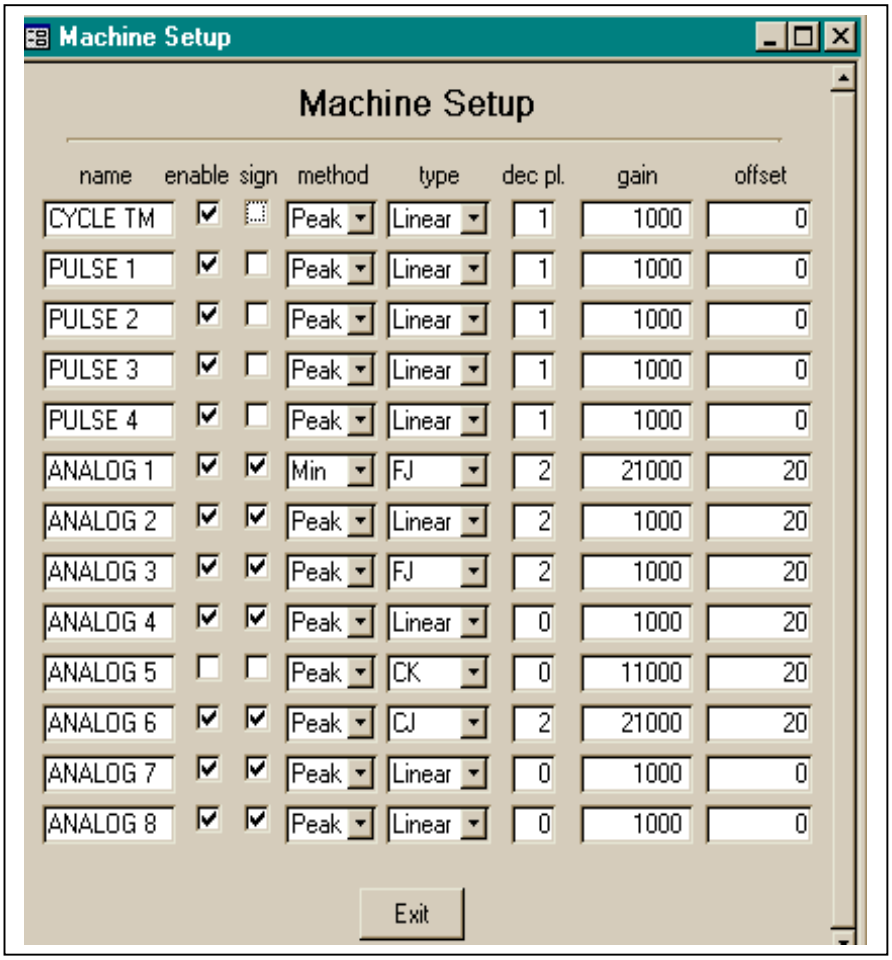
Press: *any one of (7) seven types of data*

- Machine Setup
- Misc Config
- Job Standards
- SPC Enable
- Process SPC
- Variable SPC
- Attribute SPC

The following will display:

Signals

0
1
2
3
4
5
6
7
8
9
10
11
12



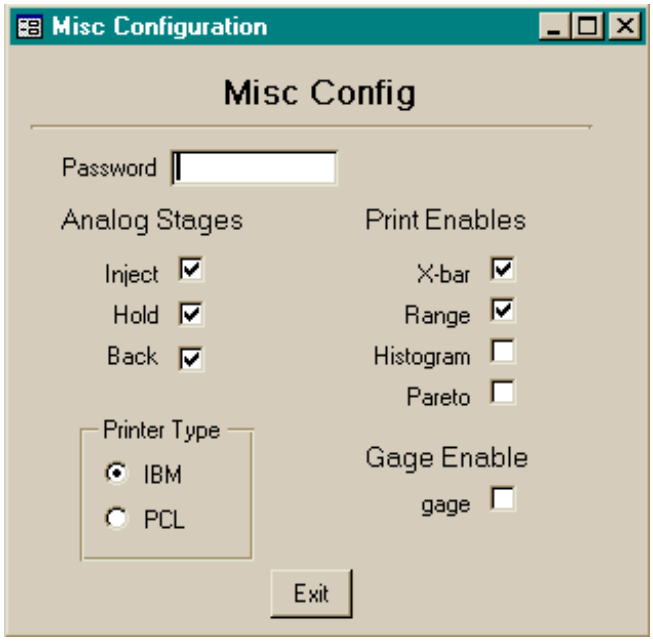
Data can be edited in each of the screens. Each edit window will resemble the corresponding screen on the SPC Analyzer. In some instances, such as under *method* and *type*, picklists are available by clicking on the down arrow. All fields under "name" can be changed. These changes will reflect in the *Process SPC* screen.

Information on field input:

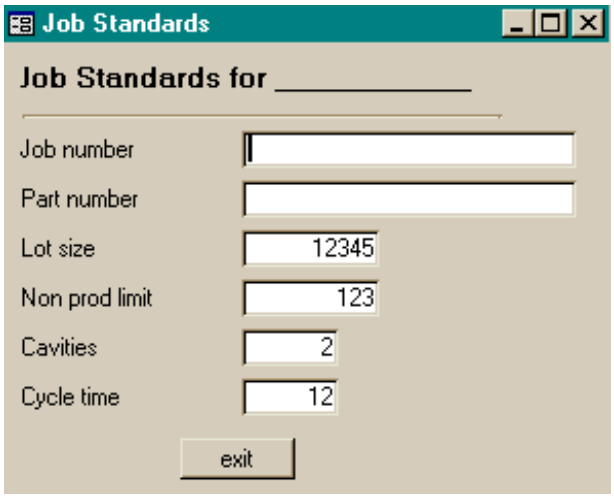
NOTE: Whenever reference is made to signals, signal 0 refers to the first field under the "name" heading in the above screen. The second field refers to signal 1; third field signal 2; etc.

name	8 Characters maximum
sign	For signal 0, 1, 2, 3, 4, 11, & 12, sign is not used and data cannot be entered
method	For signal 0, 1, 2, 3, 4, 11, & 12, method is not used and data cannot be entered
type	For signal 0, 1, 2, 3, 4, 11, & 12, type is not used and data cannot be entered
dec pl	For signal 0, must be 1 or 2 For signal 1, 2, 3, & 4, signal 0 decimal places are used and data cannot be entered For signal 5 – 10, must be between 0 and 4 For signal 11 and 12, decimal places are not used and data cannot be entered

gain	For signal 0, 1, 2, 3, 4, 11, & 12, gain is not used and data cannot be entered
offset	For signal 0, 1, 2, 3, 4, 11, & 12, offset is not used and data cannot be entered



The *Misc Config* screen will require a Password. This Password refers to the Password used in the SPC Analyzer (reference *Manual #710-0080 Section 4 Setup and Diagnostics*). This field has an 8 character maximum. The data in this screen can be edited.

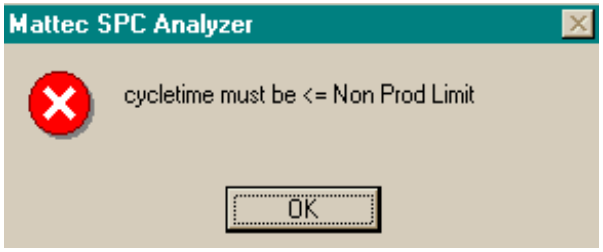


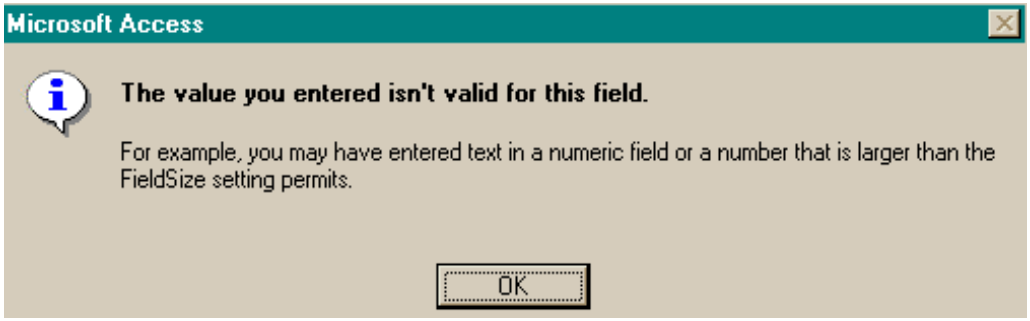
Information must be input to initiate this screen. The ***Job number*** requires a Job Name. A job name can be selected from the ***Select A Job*** picklist. If selecting a job from the picklist, the job name must be selected prior to clicking the ***Job Standards*** button.

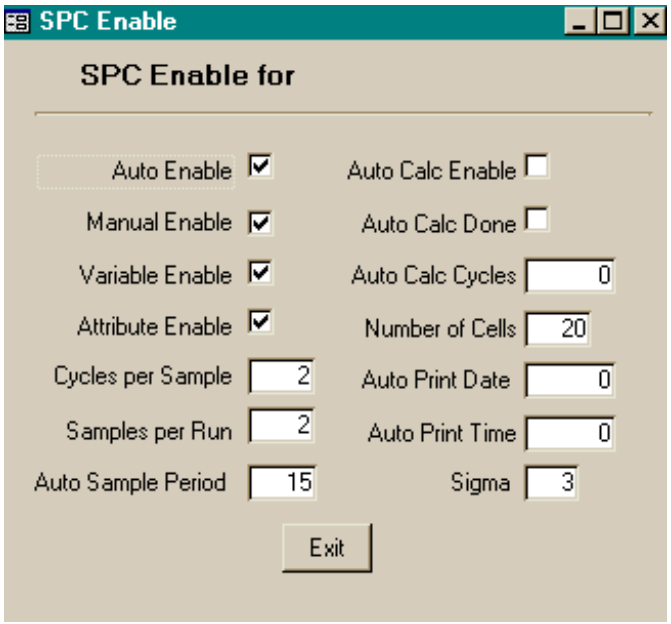
Each of the fields has maximum field sizes:

Job number	12 Characters maximum
Part number	22 Characters maximum
Lot size	Lot size must be between 0 - 999,999,999
Non prod limit	Limit must be > = cycle time, must be between 0 - 6553
Cavities	99 maximum
Cycle time	Must be < = non prod limit, must be between 0 - 6553

If information is entered which is invalid, an error message screen will display such as the following:



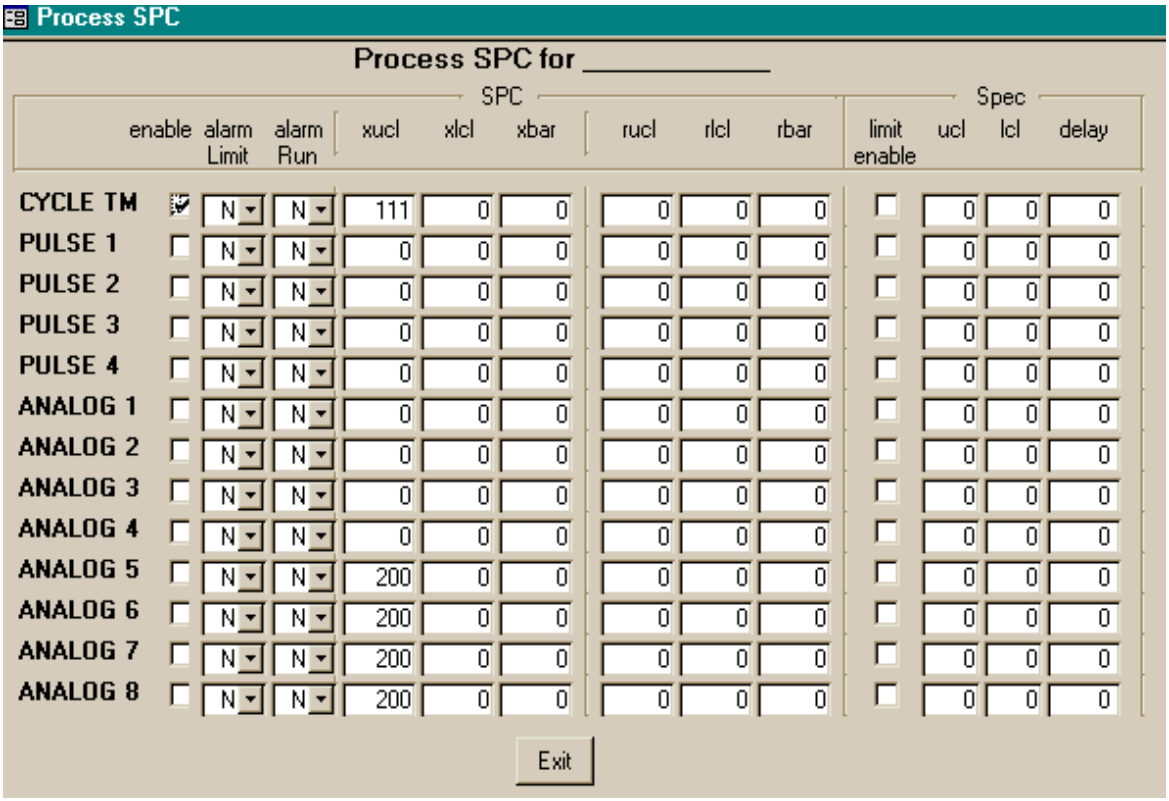




If information is entered which is invalid, an error message screen will display. The job name will appear in the title once it has been entered through the ***Job Standards*** screen.

Information on field input:

Auto Sample Period	15 - 180
Auto Calc Done	This is a read only field set by the SPC Analyzer
Sigma	Sigma must be between 0 - 9

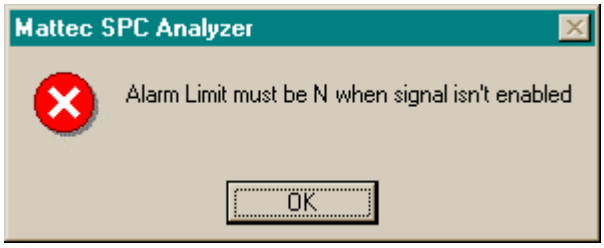


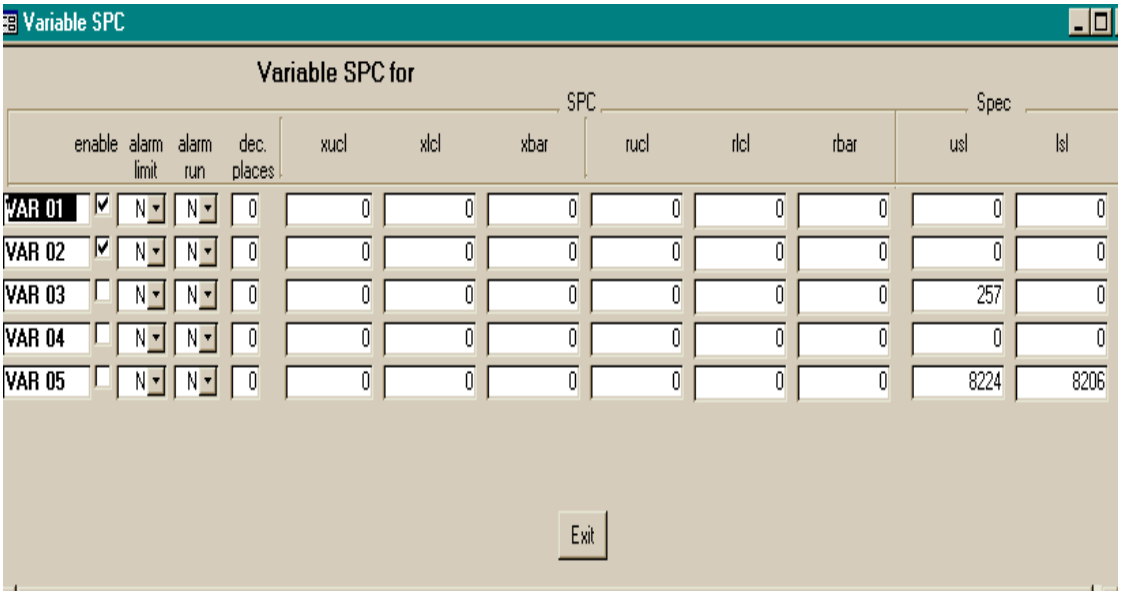
Data can be edited in each of the screens. Each edit window will resemble the corresponding screen on the SPC Analyzer. In some instances, picklists are available by clicking on the down arrow. Signal names are those defined in *Machine Setup.*

Information on field input:

alarm Limit	Must be "*N*" when signal not enabled
alarm Run	Must be "*N*" when signal not enabled
xucl, xlcl	xucl > xlcl
rucl, rlcl	rucl > rlcl
ucl, lcl	ucl > lcl

When editing certain screens, if data is not within the limits, an error message box will display such as the following:

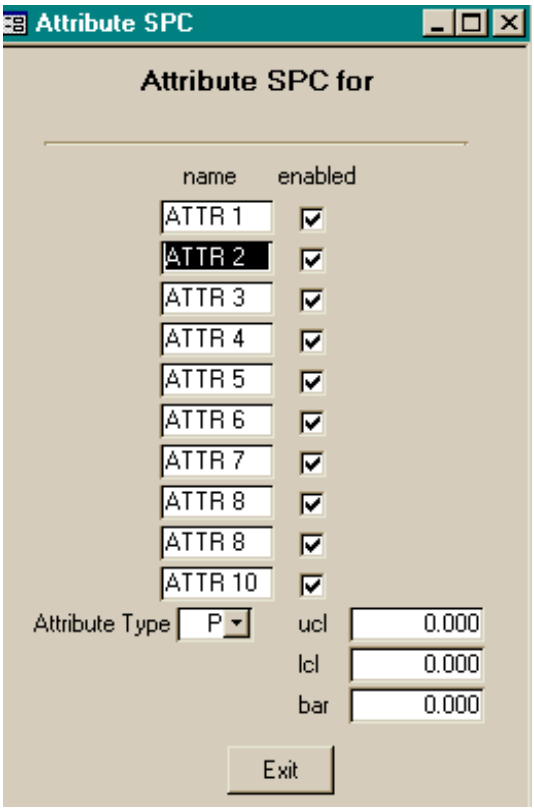




Data can be edited in each of the columns including the *VAR* column. Each edit window will resemble the corresponding screen on the SPC Analyzer. In some instances, picklists are available by clicking on the down arrow.

Information on field input:

Signal name	8 characters maximum
alarm limit	Must be "*N*" when signal not enabled
alarm run	Must be "*N*" when signal not enabled
dec places	0 - 4
xucl, xlcl	xucl > xlcl
rucl, rlcl	rucl > rlcl
ucl, lcl	ucl > lcl



Each edit window will resemble the corresponding screen on the SPC Analyzer. In some instances, picklists are available by clicking on the down arrow. The ATTR column can be changed to reflect descriptors, such as; color, shape, size, etc.

Information on field input:

name	8 characters maximum
ucl, lcl	ucl > lcl

4.5 Configuration

Click: ***Configuration*** (Figure 4-1 SPC Analyzer Import/Export Setup Screen)

The following screen will display:

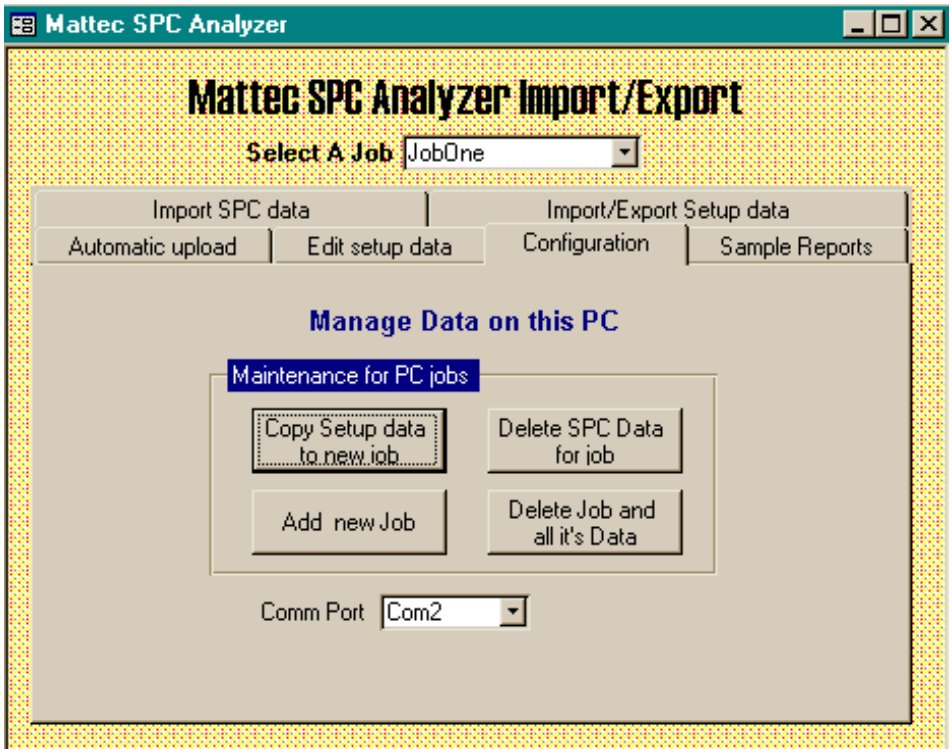
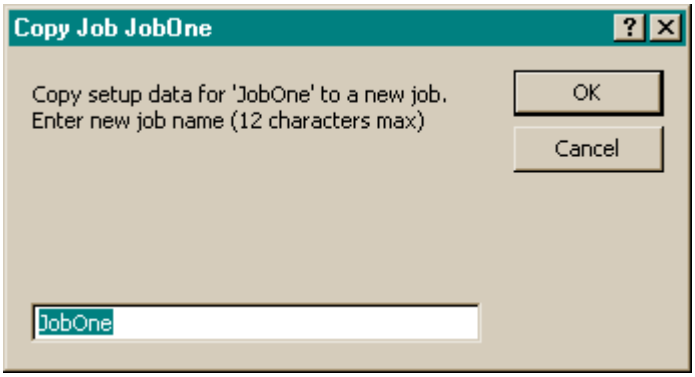


Figure 4-7 Configuration Screen

Highlight: *any job from the* ***Select A Job*** *picklist*

Press: ***Copy Setup data to new job***

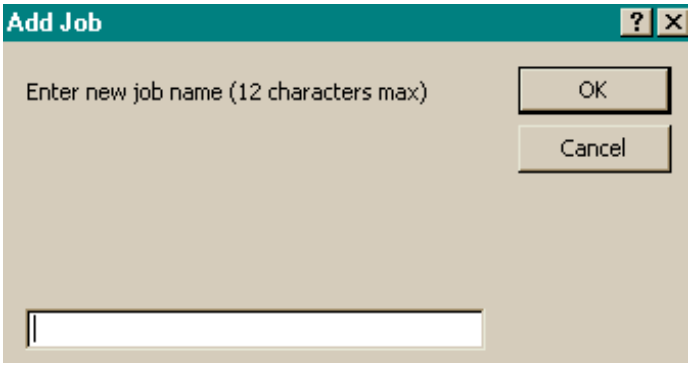
The following screen will display:



Upon entering the new job name the following screen will display:

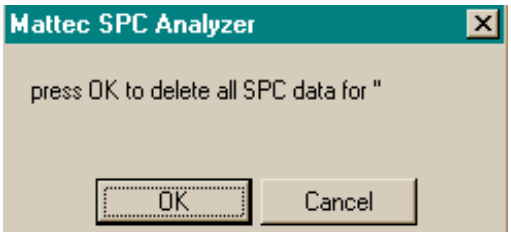
Press: ***Add new job***

The following screen will display:



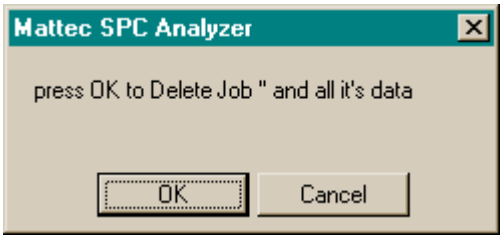
Press: ***Delete SPC Data for job***

The following screen will display:



Press: ***Delete Job and all it's Data***

The following screen will display:



Comm Port has a picklist available for selection by clicking on the down arrow. Available ports are Comm1, 2, 3 and 4.

4.6 Sample Reports

Click: ***Samples Report*** (Figure 4-1 SPC Analyzer Import/Export Setup Screen)

The following screen will display:

Figure 4-8 Sample Reports Screen

Signal has a picklist available for selection by clicking on the down arrow. ***Signal*** will change to ***Variable*** or ***Attribute*** depending upon the selection in the ***Data*** column. ***Variable*** and ***Attribute*** also have a picklist associated with them. Once all data has been selected,

Press: ***Execute***

Several sample reports and graphs are supplied with the program. These reports and graphs can be customized by the user. The following report was generated by:

Select: ***View Data by job+signal***
Select: ***Auto SPC***
Select: *Signal* ***PULSE 1***
Press: ***Execute***

Example of Report

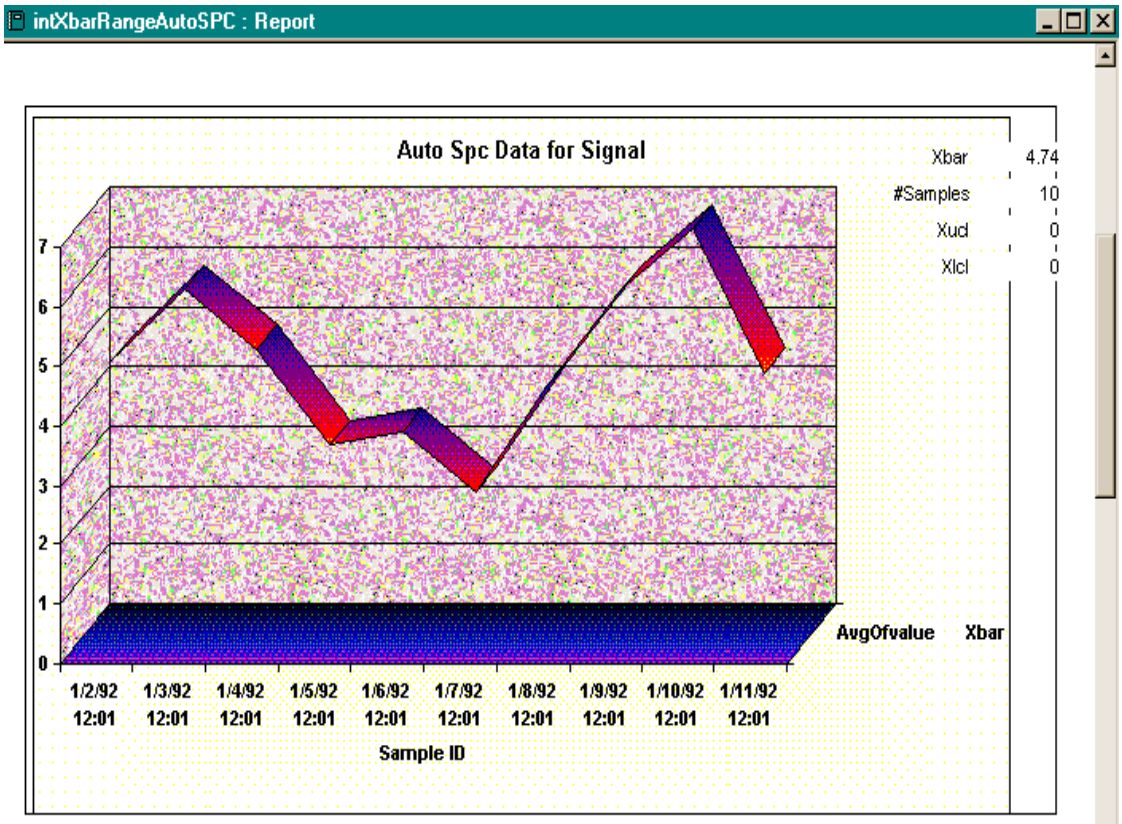
intAutoSpcDataBySignal : Select Query

JobNumber	jobkey	SignalNo	SampleID	obsno	value
GoodJobDa	2	1	01/02/92 12:01	0	7
GoodJobDa	2	1	01/02/92 12:01	1	1
GoodJobDa	2	1	01/02/92 12:01	2	7
GoodJobDa	2	1	01/02/92 12:01	3	8
GoodJobDa	2	1	01/02/92 12:01	4	7
GoodJobDa	2	1	01/03/92 12:01	0	9
GoodJobDa	2	1	01/03/92 12:01	1	3
GoodJobDa	2	1	01/03/92 12:01	2	8
GoodJobDa	2	1	01/03/92 12:01	3	4
GoodJobDa	2	1	01/03/92 12:01	4	3
GoodJobDa	2	1	01/04/92 12:01	0	7
GoodJobDa	2	1	01/04/92 12:01	1	9
GoodJobDa	2	1	01/04/92 12:01	2	5
GoodJobDa	2	1	01/04/92 12:01	3	1
GoodJobDa	2	1	01/04/92 12:01	4	7
GoodJobDa	2	1	01/05/92 12:01	0	5

Record: 1 of 50

Jobkey relates to a unique ID for the job stored in the Access table. The jobkey is subject to change based on the running job.

Example of Graph

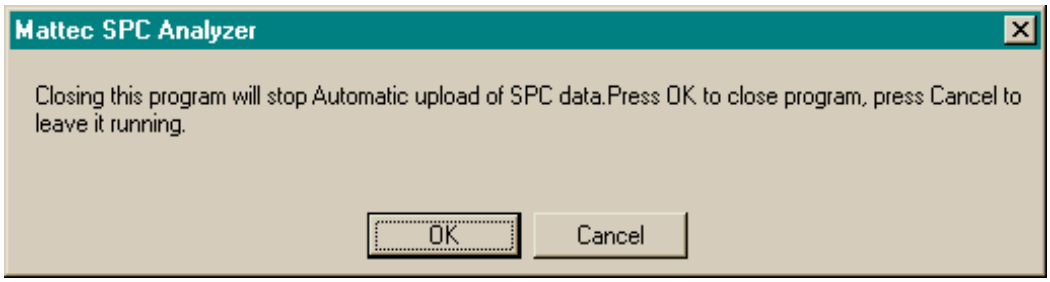


To exit the SPC Analyzer Import/Export Program:

Press:

➨ 

The following screen may display:



Press: *OK*