SAP Manufacturing Execution

How-To Guide



How To Set Up and Use the SAP ME Data Collection Feature

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1 Introduction

1.1 Purpose

This ME Help How-To-Guide for the Data Collection feature is intended to provide sufficient information to enable the user to easily configure and readily utilize the Data Collection feature making use of available best practices.

1.2 Scope

This How-To-Guide covers all aspects of the manual Data Collection feature. It also provides an overview of automatic or machine-initiated data collection.

1.3 Glossary

DC	Data Collection
eServer	The SPC server of the third-party Statit product
MII	Manufacturing Integration and Intelligence – An SAP toolset for integrating equipment to SAP applications and for the development of custom reports using real-time data
ODS Database	Operational Data Store database that contains historical detail data and summary data
PCo	Plant Connectivity – an SAP MII component used for integrating SAP applications with plant equipment and systems
POD	Production Operator Dashboard – configurable SAP ME module designed for use by factory floor operators
SPC	Statistical Process Control
Statit	An external third-party SPC product which can be integrated to SAP ME
WIP Database	Work In Process database that contains the transactional and near-term history information for SAP ME

2 Data Collection Overview

This overview provides a high level description of the Data Collection (DC) feature.

2.1 Description and Applicability

DC provides a configurable manual data collection feature that is available from a POD. It provides the capability for a user to record data for SFC numbers, resources and work centers. Collected data is stored in the SAP ME WIP database and can be automatically sent to the SPC system for processing and analysis. It can also be automatically stored in the ODS database.

Data Collection is based upon user definable data collection parameters and groups. Data collection can be initiated manually by the user and automatically by the POD. DC provides controlled capabilities for editing the collected data. Reports are available that cover the defined DC parameters and groups and the data collection results (collected data).

Facilities are provided to validate the collected data against predefined limits (min and max values) and to ensure that all required data has been collected. When a DC group fails validation tests, logging of a nonconformance can be automatically initiated.

The manual data collection capabilities are primarily applicable to low to medium volume discrete manufacturing. Automated data collection, for high speed and high-volume discrete manufacturing and for use with test equipment, is available through the use of a web service and the equipment integration feature.

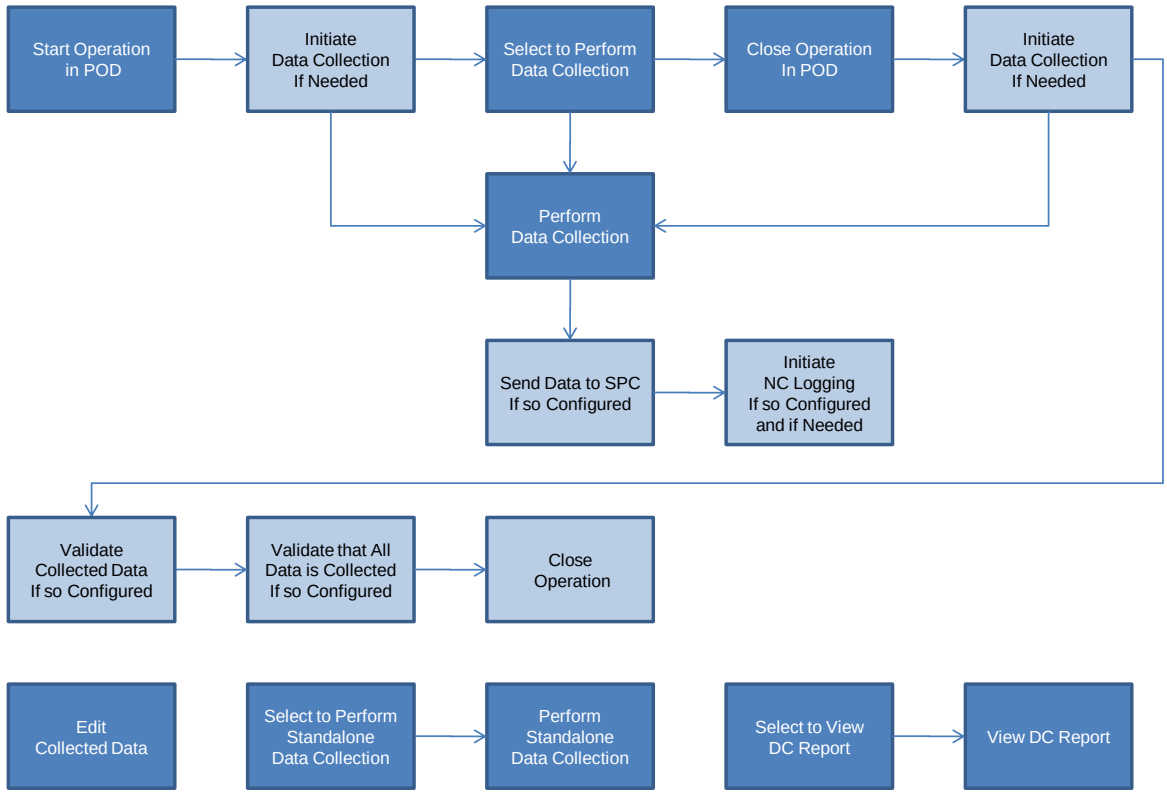
2.2 Business Purposes / Functions

The Data Collection feature provides the following functions:

- Data Collection for SFC numbers
- Data Collection Data Entry
- Standalone Data Collection
- Automated Data Collection
- Editing Collected Data
- Data Collection Reports

2.3 High-Level Process Flows

This figure illustrates the primary flow of the overall Data Collection process.



3 Data Collection Functions

3.1 Data Collection for SFC Numbers

3.1.1 Description and Applicability

The primary function of the Data Collection feature is to collect data for the individual instances of product (pieces or lots) being produced (i.e. by SFC number). Data is collected for user defined DC Parameters. These parameters are assigned to DC Groups and data is collected for them on a group by group basis. The same DC Parameter can appear in multiple DC Groups.

Data for SFC numbers can be collected at different points in the production process:

- Operation Start (initiated automatically)
- Any Time (initiated manually)
- Operation Complete (initiated automatically)

Data Collection can be initiated manually from a POD by selecting a button, or a button group entry, configured to start the DC List Display activity (DC_LIST_DISPLAY) or the DC Data Entry activity (DC500).

Collected data can be automatically sent to the SPC system for processing and analysis.

Data can be collected using different modes of collection:

- Single DC group for a single SFC number
- Single DC group for multiple SFC numbers
- Multiple DC groups for single SFC number

3.1.2 Purpose / Effects

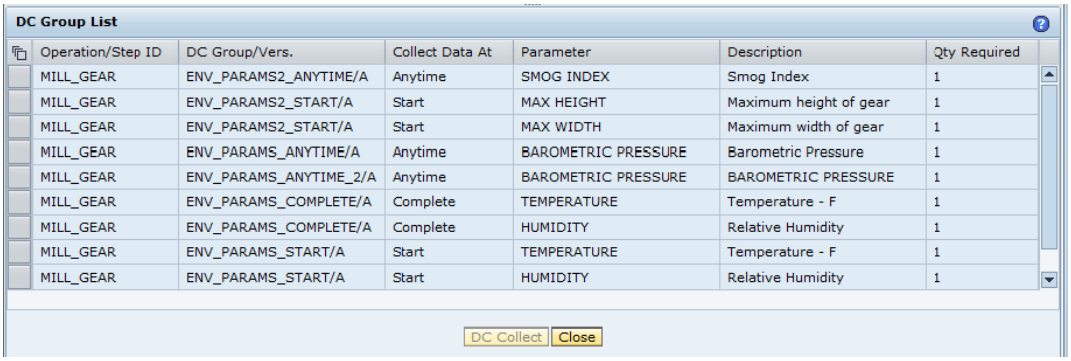
3.1.2.1 Data Collection List

The DC_LIST_DISPLAY plug-in displays the list of DC groups that are available to be collected at the current DC Group collection point. Data can be collected only for DC groups with a status of Releasable or Frozen. For Data Collection for SFC Numbers, the collection point is an SFC number at an operation. Collection points are available in the Operation POD, the Work Center POD and the Shop Workbench.

Even if a DC group has multiple attachment points (see Data Collection Maintenance in SAP ME Help) that are applicable at the current collection point, the DC group will only appear once in the list.

The list displays a row for each DC parameter in each DC group. The list enables the user to select a DC group, for which to collect data, by selecting any row containing a parameter for that DC group. The user can select multiple DC groups for data collection.

Figure – DC List screenshot



The DC list plug-in displays a DC Collect button for invoking the DC Data Entry plug-in. This button is disabled until the user selects a DC group for which data can be collected at the current stage in the processing of the operation. For this purpose, the processing stages for an operation are: Prior to Start, At Start, Started, At Complete and After Complete. Note: At Start data collection processing is only triggered by a button with a

Button ID of Start, and At Complete data collection processing is only triggered by a button with a Button ID of Complete, if the button is also configured to execute the DC List or DC Data Entry activity.

The following table shows which DC Groups (based upon their Collect Data At setting) are available for data collection at each operation processing stage.

Collect Data At \ Stage	Prior to Start	At Start	Started	At Complete	After Complete
Anytime	**X**	**X***	**X**	**X****	**X**
Start		**X**			
Complete				**X**	
Start/Complete		**X**		**X**	

* Only if there is also data to be collected for Start or Start/Complete ** Only if there is also data to be collected for Complete or Start/Complete

Data Collection during Start is only triggered if there is at least one DC group, with a Collect Data At setting of Start or Start/Complete, which is available for data collection. At this time, the user can also enter data for any DC group, with a Collect Data At setting of Anytime, which is available for data collection.

Data Collection during Complete is only triggered if there is at least one DC group, with a Collect Data At setting of Complete or Start/Complete, which is available for data collection. At this time, the user can also enter data for any DC group, with a Collect Data At setting of Anytime, which is available for data collection.

Unless the system rule Allow Multiple Data Collection is set to True, a DC parameter for a DC group with a Collect Data At setting of Start/Complete can be collected during either the Starting stage or during the Completing stage, but not both.

The DC Data Entry plug-in controls the manner and sequence of presentation of the DC groups for data collection. After data has been collected and saved for a DC parameter, the corresponding row in the list of DC groups will no longer be selectable, unless the system rule Allow Multiple Data Collection is set to True.

The layout of the DC group list is configured in List Maintenance (See List Maintenance in SAP ME Help). The identifier of the list must be specified in the DC Collect List field on the Options tab in POD Maintenance (See POD Maintenance in SAP ME Help).

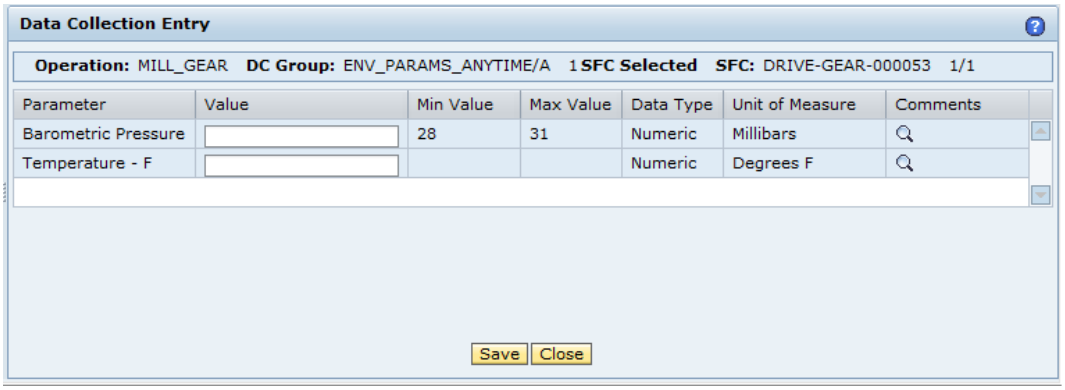
3.1.2.2 Approaches to Collection of Data

There are several approaches to managing the collection of data using the DC Data Entry plug-in. These include:

- Single DC group for single SFC number
- Single DC group for multiple SFC numbers
- Multiple DC groups for single SFC number

The Single DC group for single SFC number approach displays the DC parameters for a single DC group at a time. When the user selects the Save button, the entered data (and comments) are saved for the indicated SFC number.

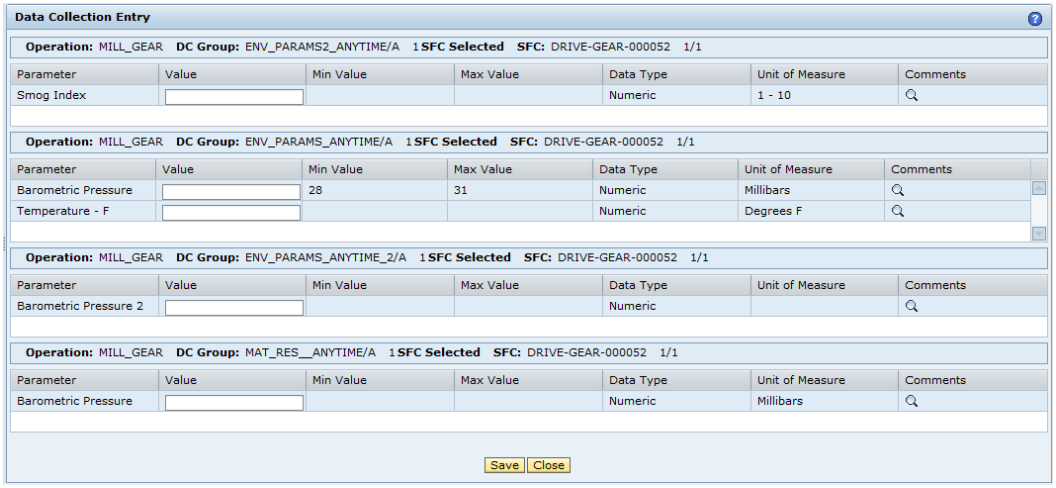
Figure – DC Data Entry for single DC group for single SFC number screenshot



The single DC group for multiple SFC numbers approach starts with the above process but then copies the entered data and comments to all of the other selected SFC numbers.

The multiple DC groups for single SFC number approach displays the DC parameters for multiple DC groups at the same time. When the user selects the Save button the entered data and comments for all of the DC parameters (for all displayed DC groups) are saved for the indicated SFC number.

Figure – Multiple DC groups for single SFC number screenshot



These approaches depend upon the following control elements:

- Collection Method field on Data Collection Maintenance main tab
- Enforce Group Mode activity rule for DC500 (DC Data Entry)
- Process All DC Groups activity rule for DC500 (DC Data Entry)
- Show Apply to All activity rule for DC500 (DC Data Entry)
- Apply to all SFCs checkbox in the DC Data Entry plug-in

When the Collection Method is Manual – Single, data is always collected for one SFC number at a time.

If only one SFC is selected and multiple DC groups are selected, the approach is determined by the Process All DC Groups activity rule. If the rule is set to False, the Single DC group for single SFC number approach is used. If the rule is set to True, the Multiple DC groups for single SFC number approach is used.

If multiple SFCs are selected and multiple DC groups (each with a Collection Method of Manual – Single) are selected, the data is collected one SFC and one DC group at a time. The sequence of data collection is to collect data for the first DC group for each SFC (one SFC at a time), then to collect the data for the next DC group for each SFC (one SFC at a time) and so on, until the data for all DC groups has been collected for all SFCs.

If there are multiple DC groups with a Collection Method of Manual – Multiple, there are multiple SFCs selected and the Process All DC Groups activity rule is set to True, the rule is ignored. The Multiple DC groups for single SFC number approach is used.

If the Collection Method is Manual – Multiple, there are multiple SFC numbers and the Process All DC Groups is False, the following table shows the relationship between some of the above control elements and the approaches used.

Enforce Group Mode	Can process all SFC numbers	Show Apply to All	Apply to All checkbox	Approach
No	Yes	Yes	Checked	Single DC group for **multiple** SFC numbers
No	Yes	Yes	Not checked	Single DC group for **single** SFC number
No	Yes	No	N/A	Single DC group for **multiple** SFC numbers
No	No	N/A	N/A	Single DC group for **single** SFC number
Yes	Yes	Yes	Checked	Single DC group for **multiple** SFC numbers
Yes	Yes	Yes	Not checked	Single DC group for **single** SFC number
Yes	Yes	No	N/A	Single DC group for **multiple** SFC numbers
Yes	No	N/A	N/A	Error

If multiple DC groups are selected and there is at least one that has Collection Method set to Manual – Multiple and at least one that has Collection Method set to Manual – Single, the DC groups with Manual – Single are processed first, followed by the DC groups with Manual – Multiple.

3.1.2.3 Data Collection Validation

There are two types of after-the-fact validation available in DC: Limit Checks and Missing Required Values. These validations are performed by special activities attached to hook points (typically the Pre-Complete hook on an operation).

3.1.2.3.1 Limit Checks

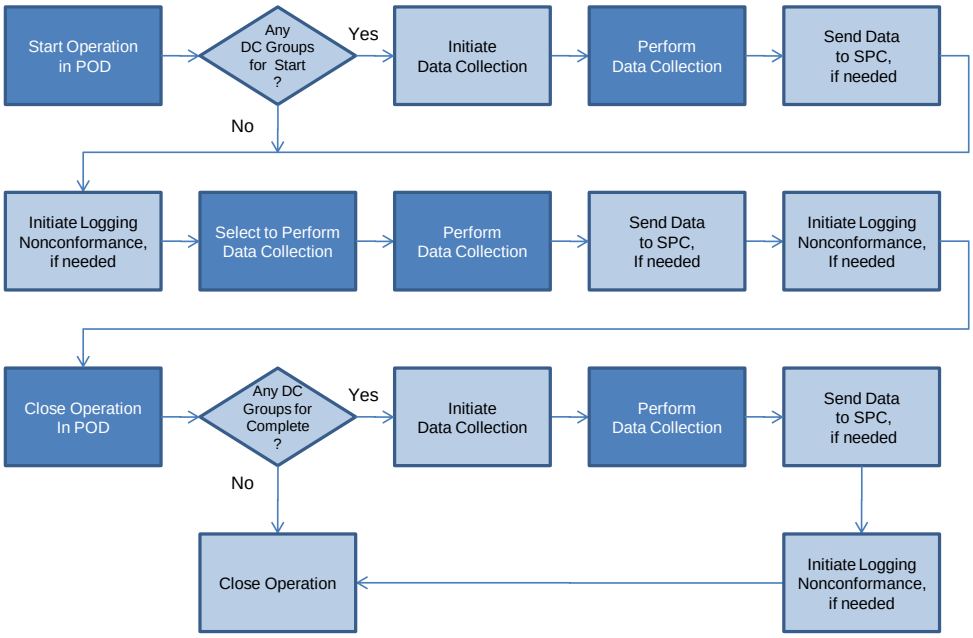
The Data Collection Limit Checks activity (DC521) checks all data, collected at the current operation and all previous operations on the routing. It ensures that each saved value is within the Min / Max limits for the DC parameter to which the value belongs. If a value is outside the Min / Max limits, an error message is displayed and the user action (e.g. Complete) is stopped. The saved value that is outside the Min / Max limits needs to be updated, to bring it within the limits, using the Data Collection Edit activity (DC400). The user can then retry the action that was stopped by the data collection limit checks.

3.1.2.3.2 Missing Required Values

The Open Data Collection Check activity (DC520) checks all DC groups attached to an SFC at the current operation and all previous operations. It ensures that there is no missing required DC parameter value. If a DC parameter allows the use of the special "Missing Value" character, and that character has been saved as the DC parameter value, the open data collection check will pass. If there is a missing required DC parameter value, an error message is displayed and the user action (e.g. Complete) is stopped. To enter the missing value the user needs to use the SFC Step Status activity (SU500) to put the appropriate routing step into the status needed for performing data collection for the missing DC parameter value. The user can then retry the action that was stopped by the open data collection check.

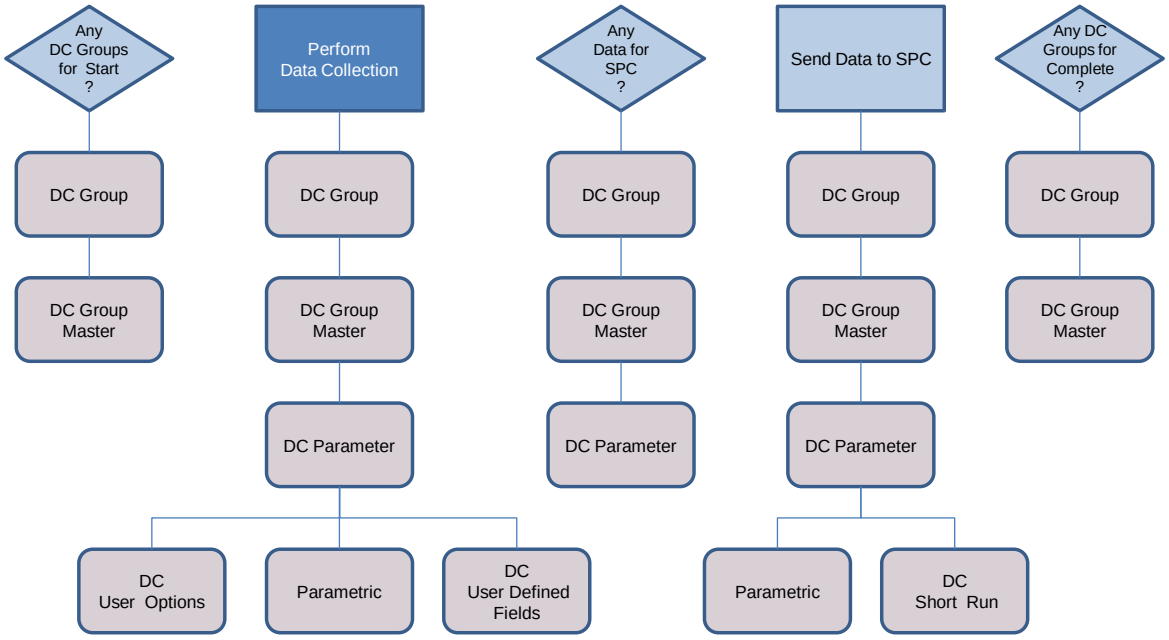
3.1.3 Process Flow

This figure illustrates the high-level flow for Data Collection for SFC Numbers.



3.1.4 Data Model

The following figure shows the relationship between some Data Collection for SFC Numbers functions and SAP ME database tables.



3.1.5 Function Specific Setup

For setting up this function, see Data Collection Maintenance in SAP ME Help.

3.1.6 Best Practices

3.2 Data Collection Data Entry

3.2.1 Description and Applicability

This POD plug-in enables a user to enter data and comments for DC parameters. Data is entered in data entry fields in the table displayed in the plug-in. The layout of this table is configured in List Maintenance (see List Maintenance in SAP ME Help). The identifier of the list must be specified in the DC Entry List field on the Options tab in POD Maintenance (see POD Maintenance in SAP ME Help).

The user can enter values for the DC parameter itself and for User Defined Fields associated to the DC parameter. The user can enter comments regarding the DC parameter by selecting the icon in the Comments column in the table.

A DC group can be defined to require user authentication for the collection of the data parameter values. This authentication assures that the user has the correct certification to enter the data values.

When the user selects to save the entered data, it is saved either to the WIP database or to the ODS database, depending upon the setting for the Store Data Collection Results in ODS system rule. If the rule is set to true, the data is saved only to the Archive tables in the ODS database. If the rule is false, the data is saved only to the Parametric Measure table in the WIP database.

If the DC group is marked as an ERP group, and the ERP Integration Active system rule is true, the entered data is also sent to the SAP ERP system.

Immediate processing of the entered data depends upon several factors:

- Pass/Fail setting for the DC group
- For the DC parameter:
  - Min Value and Max Value settings
  - Override Min/Max setting
  - Certification for override
  - Allow Missing Values setting
  - Type
  - Mask setting
  - Number of Required Data Entries
  - Perform SPC Analysis setting
- Apply to All SFCs checkbox in NC Data Entry plug-in
- Auto Next activity rule for DC List Display

3.2.2 Purpose / Effects

3.2.2.1 Limit Checking & Certification

If the Pass/Fail setting for the DC group is false (not set) and the Type of the DC parameter is Numeric or Formula, and the Min Value and Max Value are specified and both Soft Limit Check on Min/Max Value and Override Min/Max are disabled, then system does not allow saving out-of-range values. If the entered value is within the Min/Max limits, it is accepted and saved without further user action.

Soft Limit Check on Min/Max Value verifies out-of-range values for DC parameters and if such values are found, then the confirmation popup window opens. If the user confirms that out-of-range values must be saved, then the system writes data to the database as is. If the user cancels the confirmation, then the system returns to the previous screen where the user can change the out-of-range value.
If the Override Min/Max is enabled standalone or in addition to Soft Limit Check on Min/Max Value, and a certification is assigned, then the system asks for the confirmation to proceed with the Override Process. Without a certification, the Override Min/Max behaves the same way as Soft Limit Check on Min/Max Value.
If the Override Process is initiated, then a notification message "Perform overrides (Message 15241)" is displayed in the DC Data Entry plug-in and:

- If the user has the certification, the user can override the Min/Max check and the entered value is accepted and saved.
- If the user does not have the certification, a user who has the certification can login and override the Min/Max check, causing the entered value to be accepted and saved.

If the Pass/Fail setting for the DC group is true (set), the Override Min/Max setting is forced to true (set), and Fail/Reject Number is empty, then:

- If an override is performed, manually or automatically, for all parameters in the DC group, then if the activity rule LogNC ID on Group Failure is set to:
  - NC_DATA_ENTRY – The NC_Data_Entry plug-in will be initiated for the logging of a nonconformance by the user
  - None – Logging of a nonconformance will not be initiated
- If an override is not performed for all parameters in the DC group, then logging of a nonconformance will not be initiated

If the Fail/Reject Number is not empty, then the system checks if a number of normal parameters that are out of range is greater than this limit. If so, then logging of nonconformances is initiated.

3.2.2.2 Allow Missing Values

If the Allow Missing Values setting for the DC parameter is true (set), the user can enter a special character instead of a valid value for a required DC parameter (see External Program Setup). This special character can be replaced with a valid value in Data Collection Edit at a later time.

If the Allow Missing Values setting for the DC parameter is false (not set), the user must enter a valid value for every required DC parameter in the DC group, in order to save any value or comment for the DC group.

3.2.2.3 Type

The Type of the DC parameter can be:

- Numeric
- Boolean
- Formula
- Text

The following table describes each Type and the allowed characters for data entry.

Type	Description	Valid Characters
Numeric	Simple numeric value	0 1 2 3 4 5 6 7 8 9 + - .
Boolean	Boolean (0 / 1)	User defined 0 and 1 values
Formula	User defined formula calculates the entry value	See Formula section below
Text	Alphanumeric string	Any alphanumeric characters

3.2.2.4 Formula

When defining a DC parameter, the user can specify a formula that is used to calculate the value for the DC parameter, instead of the user entering the value. The formula can be set up to use previously entered values in the calculation. The user does not enter a value at the time that the DC parameter, with a type of Formula, is being collected (calculated). For more details, see Writing Formula Scripts in SAP ME Help.

3.2.2.5 Mask

An immediate validation is performed on the entered value if the DC parameter type is Numeric, Formula or Text and the Mask value is not empty. Each character in the entered value is compared against the Mask setting for that character position. If all characters in the entered value meet the corresponding mask requirement, the entered value is accepted; otherwise, the entered value is not accepted. For more details see Data Collection Maintenance in SAP ME Help.

3.2.2.6 Number of Required Data Entries

For each DC parameter, the user must enter the required number of data entries; otherwise, an error message is displayed and the entered data for the DC group is not saved to the database.

3.2.2.7 Perform SPC Analysis

If Perform SPC Analysis is true (set) for the DC parameter, the entered data value is sent to the SPC function to be processed for the specified chart. Depending upon the contents of the Expression Builder for the DC parameter, a calculation may be performed on the entered value prior to sending it to the SPC function.

The specified chart will be displayed if:

- Enough data values have been sent to the SPC function for the specified chart and
  - the chart is always to be displayed

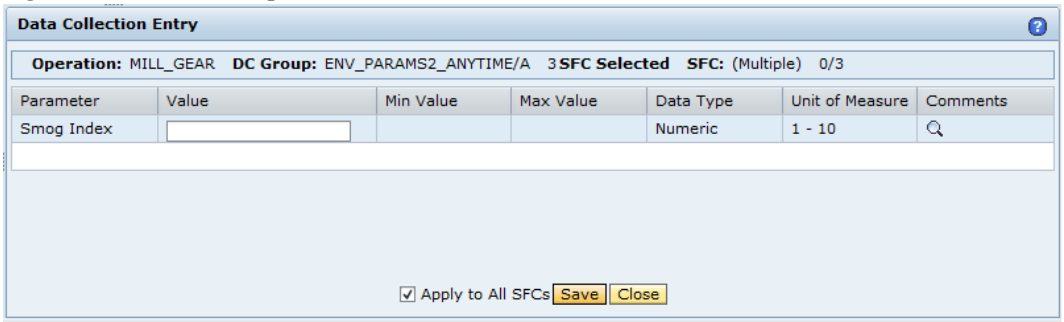
  or
  - the chart is to be displayed on alarm and the chart data meets a specified alarm criteria

If the chart is always to be displayed, but there is not yet enough data, an error message is displayed.

3.2.2.8 Apply to All SFCs Checkbox

If the activity rule Show Apply to All is set to Yes and the DC group is to be collected in Manual Multiple mode, the Apply to All SFCs checkbox is displayed in DC Data Entry. It is initially displayed selected. If it is left selected, the collected data is copied to all of the selected SFC numbers to which the DC group is associated. If the user deselects the checkbox, data collection will switch to Manual Single mode and will apply the collected data only to the current SFC number.

Figure – Manual Multiple Mode screenshot



3.2.2.9 Auto Next

When data collection for the current DC group is finished, one of the following actions may occur:

- If multiple DC groups were selected for data collection, DC Data Entry will proceed to collect data for the next selected DC group available for data collection

- If data collection for all selected DC groups has been finished and the Auto Next activity rule is set to Yes for the DC List Display activity, DC Data Entry will automatically proceed to collect data for the next DC group, in the DC list, that is available for data collection

3.2.3 Process Flow

Figure – Pass / Fail Processing

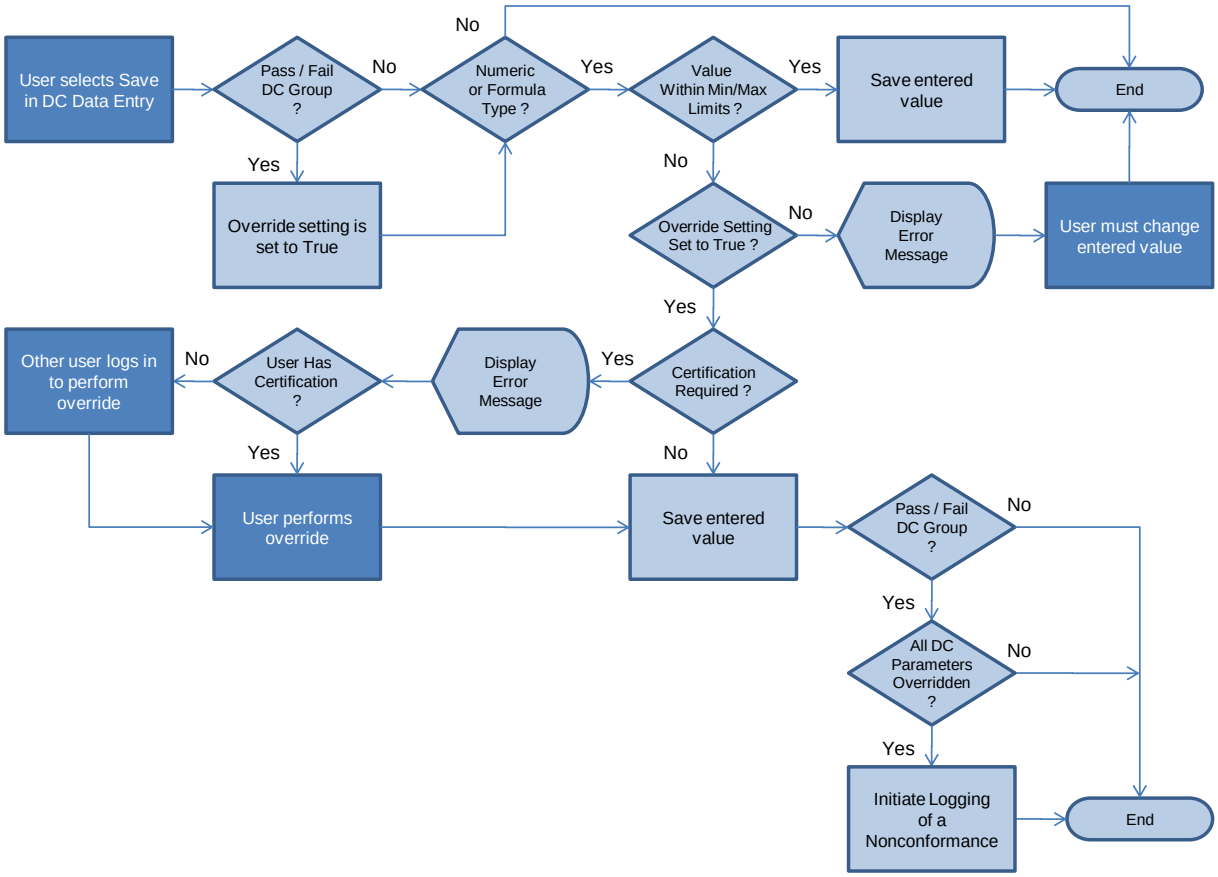


Figure – Perform SPC Analysis

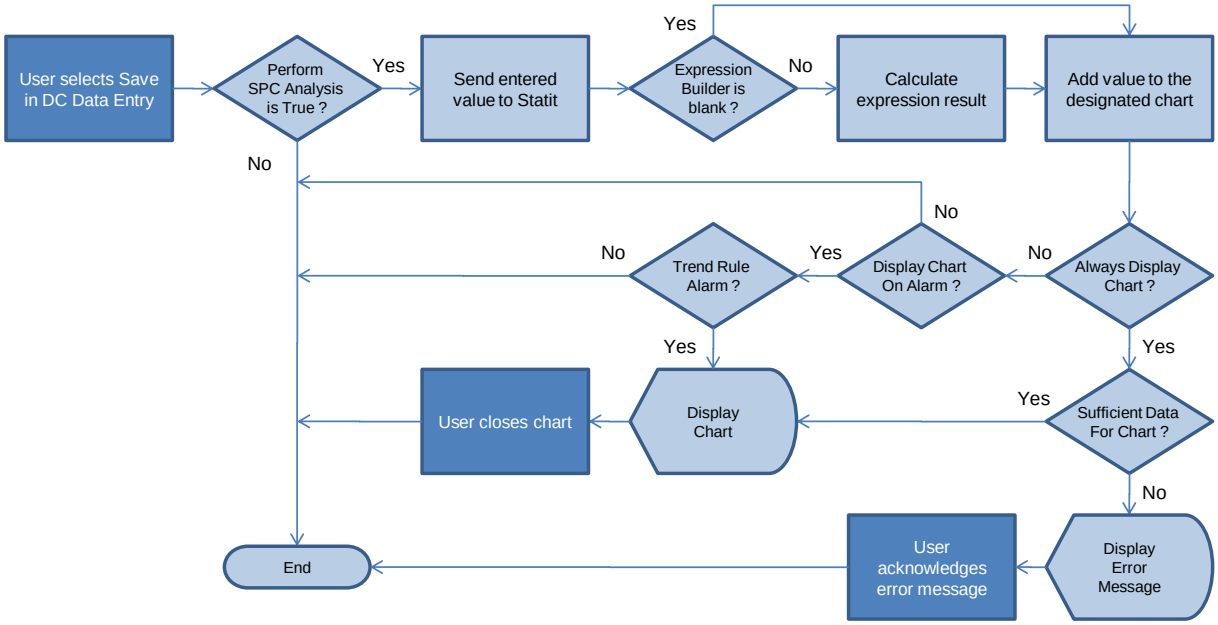
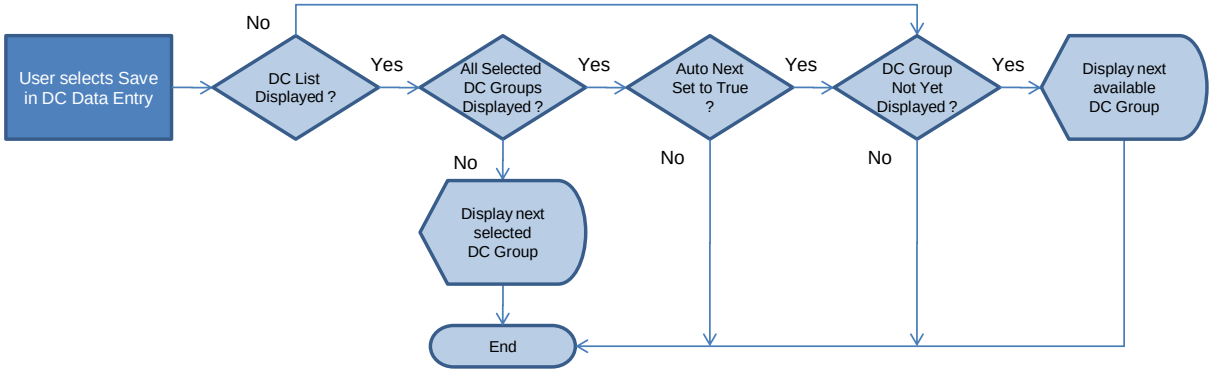


Figure – Auto Next Processing



3.2.4 Best Practices

3.3 Standalone Data Collection

3.3.1 Description and Applicability

The primary function of the Standalone Data Collection feature is to collect data for the resources and work centers being used in manufacturing. If functions almost identically to Data Collection for SFC numbers except that the DC group Collect Data At setting and the Collection Method setting are not used. Data can be collected for a single resource or work center at any time.

Standalone Data Collection can be initiated manually from a POD by selecting a button, or a button group entry, configured to start the Data Collection Standalone activity (DC550).

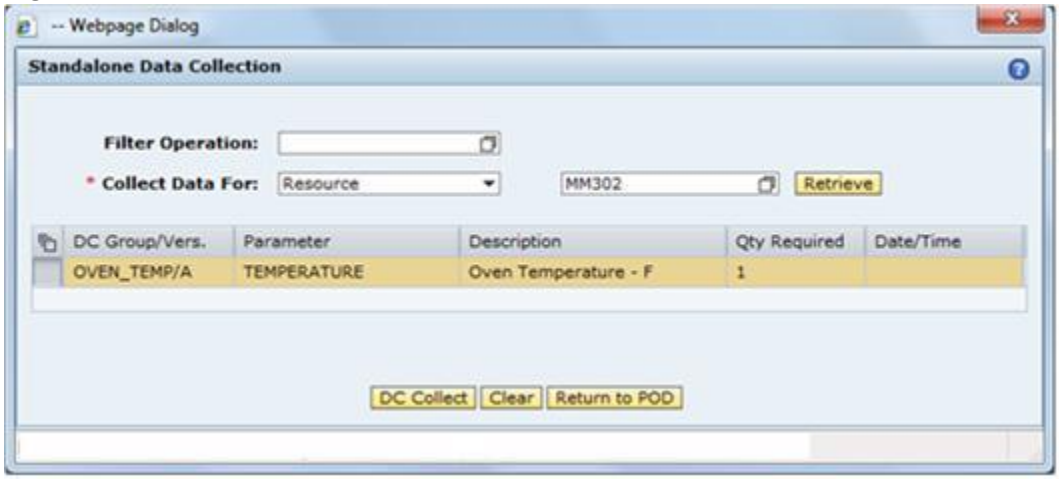
Collected data can be automatically sent to the SPC system for processing and analysis.

3.3.2 Purpose / Effects

3.3.2.1 Data Collection List

The Data Collection Standalone activity displays the list of DC groups that are available to be collected for the selected resource or work center. Data can be collected only for DC groups with a status of Releasable or Frozen. The Data Collection Standalone activity can be initiated from any POD.

Figure – Data Collection Standalone screenshot



Even if a DC group has multiple attachment points (see Data Collection Maintenance in SAP ME Help) the only attachment point that is used is the resource or work center. All other attachment points and objects are ignored. However, the list of resources or work centers is filtered to the ones which have a resource type that is assigned to the operation selected in the Data Collection Standalone activity.

The list displays a row for each DC parameter in each DC group. The list enables the user to select a DC group, for which to collect data, by selecting any row containing a parameter for that DC group. The user can select multiple DC groups for data collection.

A DC Collect button is displayed for invoking the DC Data Entry plug-in. This button is disabled until the user selects a DC group for which data can be collected.

3.3.2.1.1 DC Data Entry

The Data Collection Standalone activity uses the same DC Data Entry activity (DC500) as is used by Data Collection for SFC Numbers (See Data Collection Data Entry).

3.4 Automated Data Collection

Automated data collection provides the capability to collect data for an SFC or a resource, without user interaction. Note: In order to record data only against a resource, a data collection group must be used (see Appendix B).

3.4.1 Description and Applicability

Automated data collection can be accomplished in several ways:

- Using DC Groups and the Log Parametric Data web service
- Using Test Plans and the Log Parametric Data web service
- Using only the Log Parametric Data web service
- Using PCo in conjunction with one of the above methods

The Log Parametric Data web service is used to store parametric data in either the WIP or ODS database. All data values from the Log Parametric Data web service, and all data values from manual data collection, are stored in the same parametric data tables in the SAP ME database. Typically, automated data collection is provided through custom programming done in a PLC for a piece of shop floor equipment (such as an automated test machine) or by another shop floor system.

For more information regarding the Log Parametric Data web service, see Appendix A of this document.

Automated data collection typically requires a custom services project for implementation.

3.4.1.1 DC Groups

By defining a DC group and DC parameters, the Log Parametric Data web service can be used to store parametric data for the DC group and parameters. This approach has the advantage that SAP ME will apply the DC group processing logic just as if the data had been entered using the DC Data Entry plug-in.

If a DC group parameter is configured for SPC, the data for it will be passed to the Statit eServer and processed for the chart associated to the parameter.

The data will be stored in either the WIP database or the ODS database, depending upon the setting for the Miscellaneous system rule *Store Data Collection Results in ODS*.

3.4.1.2 Test Plans

SAP ME Test Plans can also be used with the Log Parametric Data web service to store parametric data in the SAP ME database for the test plan measurements. This approach has the advantage that the PLC, Test equipment or other system can obtain test plan information for the material and operation from SAP ME. The measurements and their limits can be obtained from SAP ME via web services starting with SAP ME 6.0.3. The web service for obtaining the test plan information is generated automatically from the public API for the Test Plan feature. The Log Parametric Data web service can be used to communicate the test results to SAP ME.

The data will be stored in either the WIP database or the ODS database, depending upon the setting for the Miscellaneous system rule *Store Test Plan Results in ODS*.

3.4.1.3 Combination – DC Group and Test Plan

The two approaches above can be used together. The test plan can be used to provide measurement definitions, with limits, to the test equipment and a DC group and parameters can be used to process the data in SAP ME and to pass it to the SPC system for analysis and charting. For this combined approach, the test plan measurement names must match the DC group parameter names. The Log Parametric Data web service should include the DC group name and the test results, as well as the data values.

The data will be stored in either the WIP database or the ODS database, depending upon the setting for the Miscellaneous system rule *Store Data Collection Results in ODS*.

3.4.1.4 Parametric Data Only

The Log Parametric Data web service can be used standalone (without a DC group or a test plan). In this situation, the parametric data values are stored in the database with a sequence number for each value, but there is no association with a DC parameter or a test plan measurement.

The data will be stored in either the WIP database or the ODS database, depending upon the setting for the Miscellaneous system rule *Store Data Collection Results in ODS*.

3.4.1.5 PCo

SAP ME Plant Connectivity (PCo) provides capabilities for integrating with shop floor equipment and shop floor systems. It can be used to process a data file and generate a Log Parametric Data request with the data from the file. For more information see Plant Connectivity in SAP Help. An SAP ME How-to-Guide for Plant Connectivity is planned, but is not currently available.

3.4.1.6 SFC Parametric Check

When the Test Status element is set in the Log Parametric Data request, the SFC Parametric Check activity (TP110) can be used to determine if the SFC number passed its last test. Typically, this activity is used as a hook activity, attached at a PRE_START hook point.

3.4.2 Setup

For automated data collection, the appropriate system rule (*Store Data Collection Results in ODS* or *Store Test Plan Results in ODS*) should be set to TRUE. This is to prevent any performance issues for SAP ME users during periods when large amounts of parametric data could be added to the database. It also prevents the WIP database from growing too fast.

For Test Plan setup, see Test Plan Maintenance in SAP ME Help.

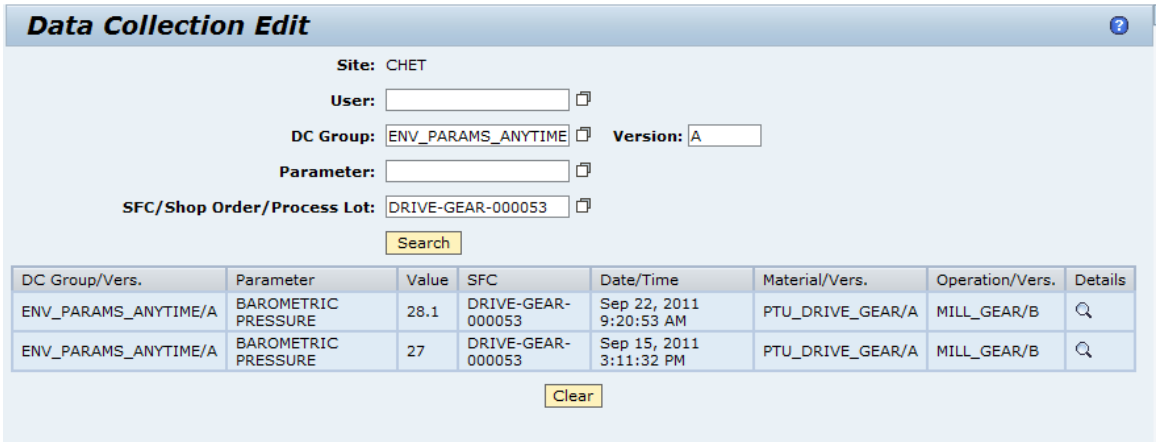
3.5 Editing Collected Data

3.5.1 Description and Applicability

The Data Collection Edit activity (DC400) enables the user to edit previously collected DC Parameter values, Comments and User Defined Field values. Any user with permissions to execute the Data Collection Edit activity can change any data collected by any user for any DC group. The system records a history of all changes to the DC parameter values, but does not keep a history of the changes to the Comments or the User Defined Field values.

The user can perform a search for the data collection records that need to be edited. The search results are displayed in a list. The user can select the Details icon to edit the data for the DC parameter in that row of the table. On the Data Collection Edit Details screen, the user can enter a new value for the DC parameter or for any User Defined Field associated to that DC parameter.

Figure – Data Collection Edit screenshot



3.5.1.1 Fields

The following tables describe fields requiring explanation:

Data Collection Edit Screen

Field	Description
User	User ID used to filter the search results
DC Group / Version	DC Group name and Version used to filter the search results
Parameter	DC Parameter name used to filter the search results
SFC / Shop Order / Process Lot	SFC Number, Shop Order number or Process Lot number used to filter the search results

Data Collection Edit Detail Screen

Field	Description
Current Version	Displays an X if this is the current version of the DC group
Original Value	Displays the original value for the DC parameter
Current Value	Displays the current value for the DC parameter
New Value	Specifies the value to replace the current value
User Defined Fields	Displays current values for the User Defined Fields for the DC parameter. These fields are defined on the *User Defined Fields* tab in *Data Collection Maintenance*. The displayed values can be edited.
Comments	Displays the comments for the DC parameter. The comments can be edited.

3.6 Data Collection Reports

3.6.1 Description and Applicability

Two reports provide access to data collection information. The Data Collection Definition Report (See Data Collection Definition Report in SAP ME Help) can be used to display all of the information used to define any DC Group and its DC Parameters. The Data Collection Results Report (see Data Collection Results Report in SAP ME Help) can be used to display the collected data for any data collection record.

4 Integration

4.1 SAP ME ERP Integration

If you use the SAPMEINT component, see Integration of Transaction Data in SAP ME Help. If you require the contents of a DC group to be sent through SAPMEINT, the *ERP Group* checkbox must selected.

4.2 SPC Integration

If you use Statit, the SPC component, see Statistical Process Control in SAP ME Help. If you require the collected data for a DC parameter to be sent to Statit, the *Perform SPC Analysis* checkbox must be selected and the chart name must be provided in the SPC Chart field in DC Group Maintenance (see Data Collection Maintenance in SAP ME Help).

5 Data Collection Setup

5.1 External Configuration

5.1.1 Installation

5.1.1.1 ME SPC Server

In order to utilize the SPC charting capabilities, the SAP ME SPC server software must be installed and started.

5.1.1.2 Statit

In order to utilize the SPC charting capabilities, the SPC system (Statit) must be installed.

5.1.2 External Program Setup

The following configuration tasks must be performed external to the SAP ME application.

5.1.2.1 Internet Explorer

In order to use the data collection formula capabilities, you must enable the use of Java Script on the SAP ME server.

5.1.2.2 ME Properties File

The missing values character is defined in the `LocaleSpecificText.properties` file. The default value is the letter M. Modify the missing values character as needed.

5.1.2.3 Statit

In order to utilize the SPC charting capabilities, Statit must be configured to work with SAP ME.

5.2 Maintenance Activities

5.2.1 Activity Rules

5.2.1.1 DC List Display (DC_LIST_DISPLAY)

For a table that describes activity rules and settings that you can change for this activity, see *Activity Maintenance*.

5.2.1.2 DC Data Entry (DC500)

For a table that describes rules and settings that you can change for this activity, see *Activity Maintenance*.

5.2.2 System Rules

5.2.2.1 Allow Multiple Data Collection

When set to True, this system rule enables data to be collected multiple times for the same DC Group for the same operation for the same SFC.

5.2.2.2 ERP Integration Active

This system rule must be set to True, if collected data is to be sent to the ERP system. For more information, see SAP ME ERP Integration (SAPMEINT) in SAP ME Help.

5.2.2.3 Store Data Collection Results in ODS

When set to True, this system rule causes collected data to be stored only in the ODS database (in the Archive tables) instead of in the WIP database. This is true for data collected for an SFC number and for data collected for a work center or resource.

5.2.2.4 Copy DC Data (in Serialization Category)

When set to True, this system rules enables the copying (or moving) of DC data when splitting or serializing an SFC number. For the data to actually be copied or moved, the

DC Copy activity (DC999) must also be specified for the appropriate hook point(s), Post_Split and/or Post_Serialize, in Site Maintenance.

5.2.2.5 Allow Multiple Data Collection

Set the Allow Multiple Data Collection rule to True and use one DC group if you need to collect data a variable number of times for the same SFC and operation.

5.2.2.6 Store Data Collection Results in ODS

Data collected for a work center or resource is not archived, since it is not associated to an SFC number. So, in order to ensure that this data is saved in the ODS database, the Store Data Collection Results in ODS system rule should be set to True.

5.3 Product Configuration

5.3.1 Data Collection Maintenance

See Data Collection Maintenance in SAP ME Help.

5.3.2 Operation / Resource Maintenance

5.3.2.1 Open Data Collections Check (DC520)

This hook activity checks all operations on the routing, up to and including the current operation, to ensure that the required data parameters for all associated DC groups have been collected for the current SFC number(s). This activity should be applied to the Pre-Complete hook point for an operation or resource.

5.3.2.2 Data Collection Limits Check (DC521)

This hook activity checks all operations on the routing, up to and including the current operation, to ensure that the collected data parameters for all associated DC groups do not have a data value that violates the Min/Max limits for the DC parameter. This activity should be applied to the Pre-Complete hook point for an operation or resource.

5.4 System Configuration

5.4.1 Activity Maintenance

5.4.1.1 DC List (DC_LIST_DISPLAY)

The following table describes rules and settings that you can change for this activity in Activity Maintenance (see Activity Maintenance in SAP ME Help):

Rule	Setting
AUTO_NEXT	YES (default): Displays the next DC group automatically in DC Data Entry NO: Displays only a DC group selected from the *DC List* in DC Data Entry
DATA_ENTRY_PLUGIN_ID	DC500 (default): Specifies the plug-in that opens when choosing the DC Collect pushbutton in the DC list

PLUGIN_URL	Specifies the DC List plug-in location in the SAP ME folder structure Default value: /COM/SAP/ME/DATACOLLECTION/CLIENT/DCGROUPLISTPLUGIN.JSP Caution Any changes to the PLUGIN_URL activity rule setting in *Activity Maintenance* may result in incorrect display of the plug-in in the POD. End of the caution.

5.4.1.2 DC Data Entry (DC500)

The following table describes rules and settings that you can change for this activity in *Activity Maintenance*:

Rule	Setting
ENFORCE_GROUP_MODE	Controls the behavior when a DC group of the selected SFC number has the *Manual – Multiple* collection method but the SFC numbers do not meet the criteria for the *Manual – Multiple* mode YES: Displays an error message NO (default): The *Manual – Single* mode is used for the DC group
LOGNC_ID_ON_GROUP_FAILURE	NONE or blank (default): The system does not open an plug-in when a DC group fails NC_DATA_ENTRY: The system opens the *NC_DATA_ENTRY* activity when a DC group fails
PLUGIN_URL	Specifies the plug-in location in the SAP ME folder structure Default value: /COM/SAP/ME/DATACOLLECTION/CLIENT/DATACOLLECTIONENTRYPLUGIN.JSP Caution Any changes to the PLUGIN_URL activity rule setting in *Activity Maintenance* may result in incorrect display of the plug-in in the POD. End of the caution.
PROCESS_ALL_DC_GROUPS	TRUE (default): If only one SFC is selected, the system simultaneously displays all DC groups that are to collect data for the SFC number at this attachment point FALSE: The system displays DC groups one at a time to collect data for the SFC number at this attachment point
SHOW_APPLY_TO_ALL	Controls whether the *Apply to all SFCs* checkbox is visible when you collect data in the *Manual-Multiple* mode YES (default): The *Apply to all SFCs* checkbox is visible. You may deselect the checkbox to switch from the *Manual – Multiple* mode to the *Manual-Single* mode. NO: The *Apply to all SFCs* checkbox is not visible and you must collect data in the *Manual-Multiple* mode.

5.4.1.3 Data Collection Standalone (DC550)

The following table describes rules and settings that you can change for this activity in Activity Maintenance (see Activity Maintenance in SAP ME Help):

Rule	Setting
AUTO_NEXT	YES (default): Displays the next DC group automatically in DC Data Entry NO: Displays only a DC group selected from the *DC List Display*
DC_LIST	DEF_STANDALONE (default): Specifies the name of the list, from the *DC Collect* category in *List Maintenance*, used for the *DC List*
DC_PLUGIN	DEF_DATA_ENTRY(default): Indicates the list from the *DC Collect* category in *List Maintenance* used for the *DC Data Entry* plug-in
PLUGIN_URL	Specifies the DC Standalone plug-in location in the SAP ME folder structure Default value: /COM/SAP/ME/DATACOLLECTION/CLIENT/DCGROUPLISTSTANDALONE.JSP Caution Any changes to the PLUGIN_URL activity rule setting in *Activity Maintenance* may result in incorrect display of the plug-in in the POD. End of the caution.

5.4.2 List Maintenance

5.4.2.1 DC_COLLECT List

A list that specifies the columns for the DC List Display activity must be defined in List Maintenance. It must have a type of DC_Collect. A default list is provided with SAP ME.

5.4.2.2 DC_ENTRY List

A list that specifies the columns for the DC Data Entry activity must be defined in List Maintenance. It must have a type of DC_Entry. A default list is provided with SAP ME.

5.4.3 POD Maintenance

5.4.3.1 Purpose / Effects

A POD with the following plug-ins are needed in order to utilize Data Collection for SFC Numbers:

- Data Collection List (DC_LIST_ DISPLAY)
- DC Data Entry (DC_DATA_ENTRY)

To utilize Pass / Fail processing, the NC Data Entry plug-in (NC_DATA_ENTRY) must be included in the Layout of the POD.

In order to use Standalone Data Collection, the Data Collection Standalone activity (DC550) is needed, along with the DC Data Entry plug-in.

5.4.3.2 Settings / Example

The default Operation POD, the default Work Center POD and the Shop Workbench, predefined in SAP ME, are all configured for data collection.

The following fields, on the Options tab, must be specified for data collection from a POD.

5.4.3.2.1 DC Collect List

The DC Collect List field specifies the name of the list to be used for the DC List Display activity.

5.4.3.2.2 DC Entry List

The DC Entry List field specifies the name of the list to be used for the DC Data Entry activity.

5.4.4 Best Practices

We recommend that you never modify any base definition object, such as the OPERATION_DEF POD. You should always create a new object based on the SAP supplied object.

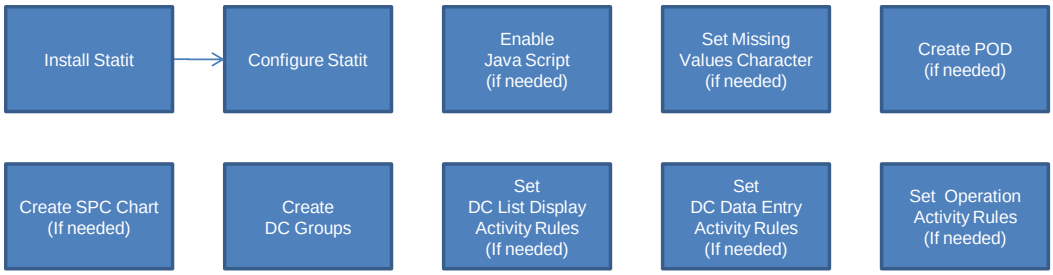
5.5 Other Maintenance Activities

5.5.1 SPC Chart Maintenance

In order to pass collected data to an SPC chart, the chart must be configured in SPC Chart Maintenance (see SPC Chart Maintenance in SAP ME Help).

5.5.2 Data Flow

The following figure shows the high-level flow for the setup of Data Collection. Unlinked items can be done in any sequence.



6 Usage Scenario Examples

6.1 Data Collection Scenario

6.1.1 Purpose / Goal

This scenario provides an example where environmental data must be collected at the start and end of an operation and characteristic data can be collected multiple times during the operation. The characteristic data must be collected at least once during the operation. The characteristic data will be passed to the SPC system for analysis using an XBar-R chart. The SPC chart will be displayed only on an alarm condition.

For this scenario the following preconditions apply:

- The Statit system has been installed and configured
- Statit Server Host Computer Name has been specified in System Rule Maintenance
- The Statit system has been started and is running
- SAP ME SPC Server software has been installed and started
- Material ACME_WIDGET has been defined
- Operation MAKE_WIDGET has been defined
- AUTO_NEXT is set to NO for the DC_LIST_DISPLAY activity
- The system rule Allow Multiple Data Collection is set to TRUE

6.1.2 Scenario Specific Settings

In order to collect data at Operation MAKE_WIDGET, Data groups must be defined and assigned to the operation. To enable data to be collected during Start and Complete of the operation, the Start and Complete buttons in the POD must be set up appropriately. In order to display the characteristic data in an SPC chart, the chart must be configured and associated to the DC group for the characteristic data. A routing, containing the operation MAKE_WIDGET, must be created and assigned to the ACME_WIDGET material.

6.1.2.1 Configure Chart

The user opens the SPC Chart Maintenance activity and specifies field values as indicated below:

Main tab

- SPC Chart — PART_TEMP_XBAR_R
- Chart Type — Xbar & R
- Subgroup Size — 3
- Max Plot Points — 30
- Max Data Age (Days) — 365

Chart Labels tab

- Chart Title — Temperature Xbar and R
- Title (Line 2) — Subgroup Average
- Title (Line 3) — Subgroup Range
- x Tick Label — Sequential (1 to N)

Primary Chart

- X Axis Label — Subgroup
- Y Axis Label — Temperature – Degrees
- Y Axis Min
- Y Axis Max
- Scale — Linear

Secondary Chart

- X Axis Label — Subgroup
- Y Axis Label — Temperature – Degrees
- Y Axis Min
- Y Axis Max
- Scale — Linear

Primary Chart Details tab

- Control Limit Options — Calculated
- Sigma Coefficient — 3
- Upper Spec Limit — 72
- Target — 70
- Lower Spec Limit — 68
- Display Spec Limits on Chart — Selected
- Enable Trend Rules — Selected
- Trend Rules — AT&T Rules

Secondary Chart Details tab

- Control Limit Options — Calculated
- Sigma Coefficient — 3

All other fields blank or unselected

Select Save

6.1.2.2 Create Data Groups

The user opens the Data Collection Maintenance activity and specifies field values as indicated below:

Main tab

- DC Group — ENV_PARMS_START
- Version — A
- Status — Releasable
- Collection Type — SFC
- Collect Data At — Start
- Collection Method — Manual – Single
- Current Version — Selected

All other fields are blank or unselected

Select Insert New

Parameter Detail Main tab

- Sequence — 10
- Parameter Name — PART_TEMP
- Description — Part Temperature
- Data Collection Prompt — Part Temperature
- Status — Enabled

- Allow Missing Values — Unselected
- Display Data Values — Selected
- Type — Numeric
- Override Min/Max — Unselected
- Min Value
- Max Value
- Mask
- Unit of Measure — Deg. F
- Required Data Entries — 1
- Optional Data Entries — 0

Parameter Detail SPC tab

- Perform SPC Analysis — Selected
- SPC Chart — PART_TEMP_XBAR_R
- Display Chart — Never
- Expression Builder

Select Apply

Select Insert New

Parameter Detail Main tab

- Sequence — 20
- Parameter Name — HUMIDITY
- Description — Humidity
- Data Collection Prompt — Ambient Rel. Humidity
- Status — Enabled
- Allow Missing Values — Unselected
- Display Data Values — Selected
- Type — Numeric
- Override Min/Max — Unselected
- Min Value
- Max Value
- Mask
- Unit of Measure — Percent
- Required Data Entries — 1
- Optional Data Entries — 0

Parameter Detail SPC tab

- Perform SPC Analysis — Unselected

All other fields are blank or unselected

Select Apply

Select Attached Tab

Attached tab

Select Insert New

Attachment Points Detail screen

- Sequence — 10
- Apply this attachment … — Selected
- Operation — MAKE_WIDGET

Select Apply

Select Save

Main tab

- DC Group ENV_PARMS_COMPLETE
- Version A
- Status Releasable
- Collection Type SFC
- Collect Data At Complete
- Collection Method Manual – Single
- Current Version Selected

All other fields are blank or unselected
Select Insert New

Parameter Detail Main tab

- Sequence 10
- Parameter Name PART_TEMP
- Description Part Temperature
- Data Collection Prompt Part Temperature
- Status Enabled
- Allow Missing Values Unselected
- Display Data Values Selected
- Type Numeric
- Override Min/Max Unselected
- Min Value
- Max Value
- Mask
- Unit of Measure Deg. F
- Required Data Entries 1
- Optional Data Entries 0

Parameter Detail SPC tab

- Perform SPC Analysis Selected
- SPC Chart PART_TEMP_XBAR_R
- Display Chart Never
- Expression Builder

Select Apply
Select Insert New

Parameter Detail Main tab

- Sequence 20
- Parameter Name HUMIDITY
- Description Humidity
- Data Collection Prompt Ambient Rel. Humidity
- Status Enabled
- Allow Missing Values Unselected
- Display Data Values Selected
- Type Numeric
- Override Min/Max Unselected
- Min Value
- Max Value
- Mask

- Unit of Measure — Percent
- Required Data Entries — 1
- Optional Data Entries — 0

Parameter Detail SPC tab

- Perform SPC Analysis — Unselected

All other fields are blank or unselected

Select Apply

Select Attached Tab

Attached tab

Select Insert New

Attachment Points Detail screen

- Sequence — 10
- Apply attachment … — Selected
- Operation — MAKE_WIDGET

Select Apply

Select Save

Main tab

- DC Group — TEMP_ANYTIME
- Version — A
- Status — Releasable
- Collection Type — SFC
- Collect Data At — Anytime
- Collection Method — Manual – Single
- Current Version — Selected

All other fields are blank or unselected

Select Insert New

Parameter Detail Main tab

- Sequence — 10
- Parameter Name — PART_TEMP
- Description — Part Temperature
- Data Collection Prompt — Part Temperature
- Status — Enabled
- Allow Missing Values — Unselected
- Display Data Values — Selected
- Type — Numeric
- Override Min/Max — Unselected
- Min Value
- Max Value
- Mask
- Unit of Measure — Deg. F
- Required Data Entries — 1
- Optional Data Entries — 0

Parameter Detail SPC tab

- Perform SPC Analysis — Selected
- SPC Chart — PART_TEMP_XBAR_R
- Display Chart — Only Alarm
- Expression Builder

Select Apply
Select Attached Tab

Attached tab

Select Insert New

Attachment Points Detail screen

- Sequence 10
- Apply attachment … Selected
- Operation MAKE_WIDGET

Select Apply
Select Save

6.1.2.3 Create POD and Configure Start and Complete Buttons

The user opens the POD Maintenance activity, retrieves the default Operation POD, configures the Start and Complete buttons and saves the results as a new POD, as indicated below:

Main tab

- Retrieve the operation type POD – OPERATION_DEF and rename it
- Select the Buttons tab

Buttons tab

- Select the Details icon in the Sequence 10 row (for the Start button)

Button Details screen

- Select Insert New
- Browse and select activity DC_LIST_DISPLAY in the new row
- Select the Apply button

Buttons tab

- Select the Details icon in the Sequence 20 row (for the Complete button)

Button Details screen

- Select the Sequence 10 row (for the PR510 activity)
- Select Insert Before
- Set the Sequence field to 5
- Browse and select activity DC_LIST_DISPLAY in the new row
- Select the Apply button

Buttons tab

- Select the Save icon

6.1.2.4 Create Activity for New POD

The user opens Activity Maintenance, retrieves the activity for the default Operation POD, renames the activity and points it to the new POD, as indicated below:

Main Tab

- Retrieve the DEF_OPER_POD activity and rename it
- Edit the Class/Program field contents and replace the POD name with the new POD name created above (follows the WORKSTATION= string)
- Select the Save icon

6.1.2.5 Create Routing

The user opens the Routing Maintenance activity and creates a routing as indicated below:

Main tab

- Enter WIDGET in the Routing field
- Enter A in the Version field
- Select the Current Version checkbox
- Select the Routing tab

Routing tab

- Select and drag the MAKE_WIDGET operation into the Routing area
- Select the Main tab

Main tab

- Select Releasable in the Status drop-down
- Select the Save icon

6.1.2.6 Assign Routing to Material

The user opens the Material Maintenance activity and assigns the routing as indicated below:

Main tab

- Browse and select ACME_WIDGET in the Material field
- Retrieve the material
- Browse and select WIDGET in the Routing field
- Select the Save icon

6.1.3 Scenario Steps

The following are examples of the steps that a user might perform in SAP ME in order to accomplish this scenario.

Create and Release SFC numbers

1. Select the Create and Release SFC activity
2. Browse and select the material – ACME_WIDGET
3. Set the Qty field to 2
4. Select the Create button
5. Note the SFC numbers created

Collect Data at Start, Anytime and Complete for first SFC number

6. Select the activity for the new POD
7. Browse and select MAKE_WIDGET in the Operation field
8. Browse and select the first SFC created
9. Select the Start button
10. The DC List plug-in will be displayed
11. Select a row for the DC group ENV_PARMS_START
12. Select the DC Collect button
13. The DC Data Entry plug-in will be displayed for the DC group

14. Enter 70 for Part Temperature
15. Enter 45 for Ambient Rel. Humidity
16. Select the Save button
17. The DC Data Entry plug-in will be closed
18. Select the Close button in the DC List plug-in
19. The DC List plug-in will be closed and the operation has been started
20. Select the DC Collect button in the POD header
21. The DC List plug-in will be displayed
22. Select a row for the DC group ENV_PARMS_COMPLETE
23. The DC Collect button in the DC List plug-in is not enabled
24. Select the row for the DC group TEMP_ANYTIME
25. Select the DC Collect button in the DC List plug-in
26. The DC Data Entry plug-in will be displayed for the DC group
27. Enter 71 for Part Temperature
28. Select the Save button
29. Close the SPC Display pop-up window
30. Repeat steps 26 through 30 two times, with values of 71.3 and 71.5
31. Select the Close button in the DC List plug-in
32. Select the Complete button in the POD header
33. The DC List plug-in will be displayed
34. Select a row for the DC group ENV_PARMS_COMPLETE
35. Select the DC Collect button in the DC List plug-in
36. The DC Data Entry plug-in will be displayed for the DC group
37. Enter 71 for Part Temperature
38. Enter 43 for Ambient Rel. Humidity
39. Select the Save button
40. The DC Data Entry plug-in will be closed
41. Select the Close button in the DC List plug-in
42. The DC List plug-in will be closed and the operation has been completed

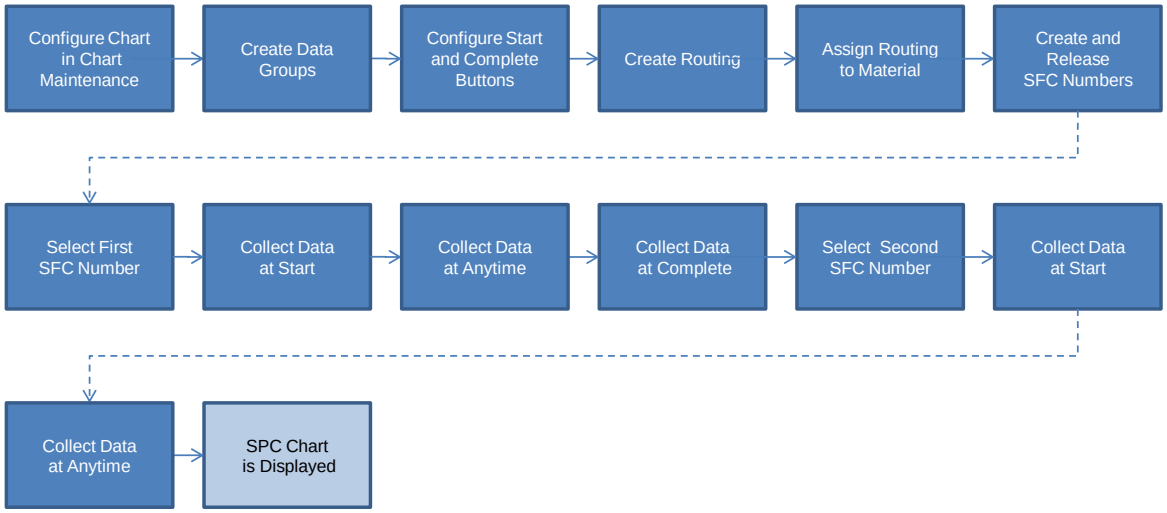
Collect Data at Start for second SFC number

43. Browse and select the second SFC created
44. Select the Start button
45. The DC List plug-in will be displayed
46. Select a row for the DC group ENV_PARMS_START
47. Select the DC Collect button
48. The DC Data Entry plug-in will be displayed for the DC group
49. Enter 71 for Part Temperature
50. Enter 45 for Ambient Rel. Humidity
51. Select the Save button
52. The DC Data Entry plug-in will be closed
53. Select the Close button in the DC List plug-in
54. The DC List plug-in will be closed and the operation has been started
55. Select the DC Collect button in the POD header
56. The DC List plug-in will be displayed

57. Select a row for the DC group ENV_PARMS_COMPLETE
58. The DC Collect button in the DC List plug-in is not enabled
59. Select the row for the DC group TEMP_ANYTIME
60. Select the DC Collect button in the DC List plug-in
61. The DC Data Entry plug-in will be displayed for the DC group
62. Enter 71 for Part Temperature
63. Select the Save button
64. Repeat steps 26 through 30 two times, with values of 72 and 73.5
65. The SPC Display pop-up window will be displayed
66. The SPC chart - PART_TEMP_XBAR_R will be displayed with an alarm indicator that a trend rule has been matched
67. This completes this data collection usage scenario

6.1.4 Scenario Flow

The following figure provides a high level flow of the Data Collection scenario.



6.2 Automated Data Collection Scenario

6.2.1 Purpose / Goal

This scenario provides an example where characteristic data can be collected multiple times during the operation. The characteristic data must be collected at least once during the operation. The same preconditions exist as for the Data Collection Scenario above, plus the following:

- Custom software has been implemented in the controller of the piece of equipment which will perform operation MAKE_WIDGET.
- The custom software has been coded to send the following web service messages to SAP ME upon occurrence of the indicated events.

Event	SAP ME Web Service Message
Arrival of material at equipment	Start SFC at operation (Start) Collect Humidity and Temperature (LogParametricData)
Five minutes after start	Collect Humidity and Temperature (LogParametricData)
Ten minutes after start	Collect Humidity and Temperature (LogParametricData)
Completion of operation	Collect Humidity and Temperature (LogParametricData) Complete SFC at operation (Complete)

6.2.2 Scenario Specific Settings

This scenario uses the same setup as for the Data Collection Scenario above.

6.2.3 Scenario Steps

The following are examples of the steps that a user might perform in SAP ME in order to accomplish this scenario.

Create and Release SFC numbers

1. Select the Create and Release SFC activity
2. Browse and select the material – ACME_WIDGET
3. Set the Qty field to 2
4. Select the Create button

The following steps occur external to SAP ME.

5. Material for creating the ACME_WIDGET arrives on a conveyor at the equipment identified as MILL_22
6. Controller for MILL_22 sends web service messages (Start and LogParametericData) to SAP ME
7. Five minutes later, controller for MILL_22 sends web service message (LogParametericData) to SAP ME
8. Five minutes later, controller for MILL_22 sends web service message (LogParametericData) to SAP ME
9. MILL_22 completes the milling of the ACME_WIDGET
10. Controller for MILL_22 sends web service messages (Complete and LogParametericData) to SAP ME
11. Material for creating the ACME_WIDGET arrives on a conveyor at the equipment identified as MILL_22
12. Controller for MILL_22 sends web service messages (Start and LogParametericData) to SAP ME
13. Five minutes later, controller for MILL_22 sends web service message (LogParametericData) to SAP ME
14. Five minutes later, controller for MILL_22 sends web service message (LogParametericData) to SAP ME
15. MILL_22 completes the milling of the ACME_WIDGET
16. Controller for MILL_22 sends web service messages (Complete and LogParametericData) to SAP ME

This completes this scenario.

7 Links to Additional Information

Plant Connectivity in SAP Help

Test Plan Maintenance in SAP ME Help

8 Overview of Changes

The following sections describe the changes made to the Data Collection feature in SAP ME 6.0.

8.1 Separate DC Plug-ins

DC List Display and DC Data Entry are now separate plug-ins (activities), which are managed individually. Data collection now functions as described in the following sections.

8.1.1 Display of DC Plug-ins

If DC_LIST_DISPLAY is configured on the Start or Complete button, then the DC List Display plug-in will be displayed when the button is selected

If DC500 is configured on the Start or Complete button, then DC Entry will be displayed when the button is selected, only if there is at least one DC Group configured to be collected at that time. DC Entry will display the first DC Group configured to be collected at that time (could display all DC Groups to be collected at that time depending upon activity rules).

8.1.2 Data Collection Processing

8.1.2.1 Start or Complete button configured with DC500 or DC_LIST_DISPLAY

If the DC List Display plug-in is not displayed, then SAP ME will:

- Display in DC Entry the available DC Groups configured to be collected at start or complete (simultaneously or one at a time per the activity rules)
- Ignore the AUTO_NEXT rule setting
- Exit Start or Complete mode of data collection when above steps are finished or when the DC Data Entry Close button is selected

If the DC List Display plug-in is displayed, then SAP ME will:

- Display in DC Data Entry the DC Group(s) selected by the user (simultaneously or one at a time per the activity rules)
- If the AUTO_NEXT rule is Yes, display in DC Data Entry the next available other DC Group to be collected.
- If the AUTO_NEXT rule is No, will **not** display in DC Data Entry the next available other DC Group.
- Exit Start or Complete mode of data collection when the Close button is selected in the DC List Display plug-in.

8.1.2.2 Button (not Start or Complete) with DC List Display

When the user selects a button, other than Start or Complete, that is configured with the DC List Display plug-in, then SAP ME will display the DC List with no DC Group selected.

When the User selects one or more DC Groups and selects the DC Collect button, SAP ME will:

- Display in DC Data Entry the selected DC Groups available to be collected (simultaneously or one at a time per the activity rules). The user can override this sequence by selecting one or more DC Groups in the DC List Display plug-in and then selecting the DC Collect button.
- If the AUTO_NEXT rule is Yes, display in DC data Entry all available other DC Groups to be collected at any time (simultaneously or one at a time per the activity rules). The user can override this sequence by selecting one or more DC Groups in the DC List Display plug-in and selecting the DC Collect button.
- If the AUTO_NEXT rule is No, will **not** display in DC Data Entry any other DC Groups, except in response to user selection of the DC Collect button in the DC List Display plug-in.

8.1.2.3 Button (not Start or Complete) with DC500

When the user selects a button, other than Start or Complete, that is configured with the DC Data Entry (DC500) plug-in, then:

If the DC List Display plug-in is **not** displayed, SAP ME will:

- Display in DC Data Entry the DC Groups available to be collected at any time (simultaneously or one at a time per the activity rules)
- Ignore the AUTO_NEXT rule

If the DC List Display plug-in is displayed, SAP ME will:

- Display in DC Data Entry the first available DC Group configured to be collected at any time.
- If the AUTO_NEXT rule is Yes, display in DC Data Entry the next available DC Group to be collected at any time. The user can override this sequence by selecting one or more DC Groups in the DC List Display plug-in and selecting the DC Collect button.
- If AUTO_NEXT rule is No, will **not** display in DC Data Entry the next available other DC Group to be collected at any time.

8.2 Collect Data Multiple Times

A new system rule, Allow Multiple Data Collection, has been added in SAP ME 6.0. This rule enables the user to collect data multiple times for the same DC group, parameter, attachment point and SFC number. This system rule applies to all DC groups for the site in which it is set. If this rule is set, the DC Limits Check activity (DC521) will check all of the collected data, for violation of the specified limits, not just the last set of values entered.

Appendix A – Log Parametric Data

Request: ParametricRequest_sync

The Parametric Data request contains one or more measurement values (either Parametric Measure and/or Parametric Custom) for an SFC number or a resource. Additional fields in the request define the context under which the measurement was taken. For more information, see SAP ME help topics for related SAP ME Objects.

Element name	Element Description	Required?
<me:SiteRef>	The site where the data was generated	Yes
<me:Activity>	The activity name to log for this Parametric Request	No
<me:CustomerID>	The customer ID of the product being tested	No
<me:DcGroupRef>	Associated data collection group	No
<me:Diagnostics>	Diagnostic values for the current test.	No
<me:ItemRef>	The material being tested	No
<me:LotId>	The lot ID of the product being tested	No
<me:OperationRef>	The operation performing the test	No
<me:ParametricCustom>	The list of custom properties (0..N)	No
<me:ParametricMeasure>	The list of measurement values (0..N)	No
<me:ProgramId>	The program name used during this test.	No
<me:ProgramRev>	The version of the program used in this test.	No
<me:ResourceRef>	The resource from which the data was generated.	No
<me:SetupTimeMs>	Time taken by the tester to set up the test.	No
<me:SfcRef>	The SFC of the unit being tested.	Yes
<me:ShiftRef>	The shift when the data was generated.	No
<me:StartTime>	The date and time the test started. Defaults to GMT if zone not provided.	No
<me:StopTime>	The date and time this test was completed.	No
<me:TestPlanRef>	The test plan used by the tester	No
<me:TestStatus>	The overall test status	No
<me:TesterHwRev>	The tester version	No
<me:TesterTestSeq>	The tester test sequence	No
<me:TesterTestSeqRev>	The version of the tester test sequence	No
<me:TimesProcessed>	Number of times SFC is being tested.	No
<me:Type>	The way data is generated. Valid values: Automated or Manual. Default value: Manual	No
<me:UnloadTimeMs>	Time taken by the tester to unload the test.	No
<me:UserRef>	The user who generated the data.	No
<me:WorkCenterRef>	The work center where the data was generated.	No
<me:ElapsedTime>	Total test duration as reported by the tester.	No
<me:RouterRef>	The routing on which the data was collected.	
<me:ShopOrder>	The product shop order ID.	No
<me:TesterType>	The type of tester.	No

Response: ParametricConfirmation_sync

The Parametric Data response contains the Transaction ID associated with a processed message. The following table lists and describes the elements that are used in the Parametric response.

Element Name	Element Description
<me:SiteRef>	The site where the data was generated.
<me:TransactionId>	A unique ID generated by the system for the set of measurements included in the request.

Appendix B – Automated Data Collection for a Resource

The following example records parametric data only against a resource (similar to Standalone Data Collection).

Sample message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
<s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<ParametricRequest_sync xmlns="http://sap.com/xi/ME">
<ParametricRequest>
        <DcGroupRef>
                <DcGroup>MOULDING</DcGroup>
                <Revision>#</Revision>
        </DcGroupRef>
        <ParametricMeasure>
                <MeasureGroup>MOULDING</MeasureGroup>
                <MeasureName>PARAM1</MeasureName>
                <Actual>100</Actual>
        </ParametricMeasure>
        <ResourceRef>
                <Resource>R_IM01_LINE</Resource>
        </ResourceRef>
        <SiteRef>
                <Site>UD02</Site>
        </SiteRef>
</ParametricRequest>
</ParametricRequest_sync>
</s:Body>
</s:Envelope>
```