

The Process and Routing System rounds out the Product Definition sub-system. This module defines how the product is produced. There are three major components to PRS+PLUS---the definition of resources, the steps to build a product (routing) and the scheduling algorithms.

Resources consist of work centers and labor grades or skills that are specified by operation.

The steps to build a product are specified by operation. Operations consist of the operation number, an indicator if the operation is a primary or one of nine possible alternates and a counter that indicates the number of steps in the operation. The following table illustrates the structure of a routing:

Operation	Alternate Indicator	Steps
0100	0	0
0200	0	0
0200	1	0
0200	2	1
0200	2	2

The Process and Routing System (PRS+PLUS) enables you to create and maintain the database that defines your production capacity, the manufacturing process and labor standards for your products. Since the work center and routing databases are used by the Shop Floor Control System to schedule your factory, the Cost Development System to cost your products and Material Control System for determining lead times, it is essential that the data reflect the reality of how you actually build your products.

Major features of the PRS+PLUS module are:

- Work center definition
- Flexible setup and run times
- Overlapping operations
- Parallel operations
- Yield by operation
- Automatic lead time calculation
- Copy routing
- Work center where-used
- Free-form text

### Work Center Definition

The work center information you maintain within PRS+PLUS describes and identifies the characteristics of each work center, including capacity, scheduling, and cost accounting information. Typically, each work center consists of the people and/or machines that are considered a single unit for purposes of stating capacity, scheduling, and costing.

- Work center ID
- Work center description
- Location ID
- Number of machine
- Crew size
- Number of schedule days per period
- Shifts per day, hours per day
- Efficiency ratio
- Inter-work-center move

### Flexible Setup and Run Time Factors

PRS+PLUS also provides a run rate code which allows you to specify the standard production output operations in the same terms in which they are engineered:

- Quantity per second
- Quantity per minute
- Quantity per hour
- Quantity per shift
- Quantity per day
- Time per unit

### Concurrent Operations

PRS+PLUS fully supports concurrent operations by allowing you to define operations as:

- Overlapping operations
- Parallel operations
- Operation splitting

### Overlapping Operations

With overlapping operations, a completed portion of one operation is passed on for processing at a succeeding operation before the remaining work is finished at the sending operation. This technique may lead to significant reductions in overall process throughput times and can help smooth the overall flow of work through each work center.

### Parallel Operations

Parallel operations are those that occur concurrently and independently. Since parallel operations are performed simultaneously, one parallel operation is not dependent on the other for its start or complete date.

### Operation Splitting

Operation splitting is the division of work for a single operation among multiple work stations. The number of available work stations is identified at the work-center level and the number of work stations used is specified by item and operation. The number of work stations you assign is used to calculate the total setup and run times for the operation.

### Yield by Operation

In many environments, operation yields are a significant factor when planning for material, determining projected load, and monitoring the performance of processes. PRS+PLUS enables you to specify the standard yield percent anticipated from each operation. Furthermore, automatic analysis calculates the cumulative yield from each subsequent operation. These cumulative yield values by operation are used in other AMAPS+PLUS modules in lead-time, back-scheduling, capacity requirements calculations, material planning and costing.

### Automatic Lead Time Calculations

PRS+PLUS automatically calculates and maintains summary lead times for your manufactured items. The summary lead times for an item are move, queue, fixed, and variable lead time. Move time is the total time necessary to move material between operations, while queue time is the total time material sits idle. Fixed lead time is the sum of all setup and fixed run times, and variable lead time is the total of all variable run times.

### Copy Routings

PRS+PLUS supports the "same-as-except" concept for copying standard routings. This feature allows you to duplicate any routing from one item to another. All operations can be copied from one item to another using a single transaction and then can be modified as needed. This copy function reduces both the amount of time required to load standard routings into the system and the chance of error associated with individually entering routing information.

### Work Center Where-Used

PRS+PLUS provides a work center where-used inquiry and maintenance panel that identifies all of the operations performed in a specific work center. This capability enables you to easily determine the impact of changes to work

centers. Work center where-used information can also help you analyze your work assignments by work center. For example, you can quickly identify the best prime and alternate operations for new or existing operations, and easily identify similar operations for estimating standard times.

### Flexible Free-Form Text

PRS+PLUS allows you to support each work center and operation with an unlimited amount of free-form text information to identify machine settings, operator instructions, setup instructions, specifications, tolerances, tooling, or any other information.

### Summary

Just as the Bill of Material System defines the material content of your products, the Process and Routing System defines the processes by which your products are manufactured. BMS+PLUS and PRS+PLUS form a solid, integrated foundation for the AMAPS+PLUS system.

	Work Center Id	Work Center Description	Schedule Resource	Run Employees	Setup Employees	Last Activity Date
1	WCEN02	ASSEMBLY AREA	L = Labor	2.00	0.00	03/17/2009
2	WCEN04	ASSEMBLY AREA	L = Labor	2.00	0.00	03/17/2009
3	WCEN13	CHOCOLATE WORK CENTE	L = Labor	2.00	0.00	08/05/2008
4	WCEN06	CLEANING	L = Labor	2.00	1.00	03/17/2009
5	WCEN01	FIRST WORK CENTER	L = Labor	2.00	2.00	04/21/2009
6	WCEN05	INSPECTION	L = Labor	4.00	1.00	03/17/2009
7	WCEN20	PACKAGING WORK CENTER	L = Labor	1.00	1.00	08/05/2008
8	WCEN03	PRE-TUNE AREA	L = Labor	1.00	1.00	03/17/2009
9	WCEN08	RUN-IN-RACKS	M = Machine	1.00	1.00	03/17/2009
10	TESTADDWC	TEST WC FOR OMS	L = Labor	999.00	999.00	03/10/2009
11	WCEN07	WORK CENTER #7	L = Labor	1.00	1.00	03/17/2009
12	WCEN09	WORK CENTER #9	L = Labor	1.00	1.00	08/05/2008
13	WCEN14	WORK CENTER 14	L = Labor	2.00	0.00	08/05/2008
14	WCEN15	WORK CENTER 15	L = Labor	0.00	0.00	08/05/2008
15	WCEN16	WORK CENTER 16	L = Labor	0.00	0.00	08/05/2008
16	WCEN18	WORK CENTER 18	L = Labor	0.00	0.00	08/05/2008
17	WCEN19	WORK CENTER 19	L = Labor	0.00	0.00	08/05/2008
18	WCEN21	WORK CENTER 21	L = Labor	0.00	0.00	08/05/2008

Process and Routing - [Item Operations Data]

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Item Number: 1800075

Copy Operations from Item:

	Operation Id	Description	Work Center Id	Operation Type
1	0010-0-0	MATERIAL PREPARATION	WCEN01	M = Manufac ▼
2	0020-0-0	MAGNETIZING	WCEN02	M = Manufac ▼
3	0030-0-0	ASSEMBLY	WCEN02	M = Manufac ▼
4	0040-0-0	PRE-TUNE PER STANDARD 21	WCEN03	M = Manufac ▼
5	0040-1-0	PRE-TUNE PER STANDARD 22	WCEN14	M = Manufac ▼
6	0040-2-1	PRE-TUNE PER STANDARD 18	WCEN15	M = Manufac ▼
7	0040-2-2	PRE-TUNE PER STANDARD 19	WCEN15	M = Manufac ▼
8	0050-0-0	BREAK IN MOTORS	WCEN08	M = Manufac ▼
9	0060-0-0	ADJUST END PLAY TO 7 LBS	WCEN03	M = Manufac ▼
10	0070-0-0	TUNE TO NEUTRALIZE	WCEN03	M = Manufac ▼
11	0080-0-0	STR. SHAFTS .015 RUNOUT	WCEN04	M = Manufac ▼
12	0090-0-0	CLEANING FUNCTION	WCEN06	M = Manufac ▼
13	0100-0-0	INSPECT PER STD # 0221	WCEN05	M = Manufac ▼
14	0110-0-0	STRIP AND ATTACH LABELS	WCEN02	M = Manufac ▼

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