# Solve the five difficult problems the manufacturing business faces with **TPiCS**

It is no wonder that you might think, "How could no more than 1 or 2 million yen systems do such a thing?" Of course, you can't solve the "difficult problems" with it just because you bought it. You have to understand the basic concepts of production control we are proposing, and to put them in practice. The road is never smooth, but it surely leads to real solutions.

When I write about only an aspect of "you can freely correct data," people unexpectedly evaluate it from the viewpoint of "internal control" these days. So I would like to mention in the beginning that there are functions such as "Authorization Management" and "Data Correction Log Management" in TPiCS-X. But my explanation in this booklet continues from here on without any of those.

## 1. The production for short-term delivery and that can handle whatever changes.

TPiCS-X allows you to change even the schedules that have already been released for orders depending on the situation, and to perform the MRP calculations including those order-released schedules.

It performs the MRP calculations based on the order-released schedules, simulating to know whether or not the whole production (orders) this time is feasible.

Since TPiCS-X performs the MRP calculations based on all unfinished schedules for today and the past starting with the current inventory, you can tell whether or not today's and tomorrow's production including customer orders for today is feasible. TPiCS-X allows you to make the production schedule with simulations and to arrange parts and materials based on the schedule.

Whereas the general MRP systems did not take care of the rest as the system after they calculated required quantities by allocating inventory and doing necessary lot sizing, and issued order forms. So you had to find out the schedule changes close at hand and to calculate using a calculator to know if the parts necessary for tomorrow's production are really sufficient.

You can leave the entire production schedule to the system in the case of TPiCS-X. In order to leave the production schedule to the system (to let the system calculate the production schedule,) however, the data used for the calculation have to be meaningful. Needless to say about inventory figures and the master tables that the system keeps, the order-released schedule data that the system keeps also have to be correctly maintained. We call this "Schedule Management" and we are going to achieve the production for short-term delivery, performing the "Schedule Management."

In order to achieve the production for short-term delivery, there are also "problems of leveling," "problems of instructions to the factory floor," "problems of suppliers" and such other than this. Refer to the separate booklet of "Solve the five difficult problems the manufacturing business faces with TPiCS" for those.

## 2. Realization of making the factory floor observable.

There are two aspects in "making the factory floor observable."
① Making the factory floor observable by improvements of the factory floor as represented by 5S's.
② Making the factory floor observable by watching the screens of the system.
As far as making the factory floor observable by the system, performing the above "Schedule Management" naturally leads to the realization of it.

## 3. No delays in shipping.

Although even TPiCS-X cannot prevent delays in shipping caused by disarsters and large-scale accidents such as earthquakes and lightning strikes, it can reduce troubles in production caused by "mistakes," "omissions," and "oversights" in everyday work by performing the above "Schedule Management" and building a mechanism to be able to foresee the troubles.

## 4. Reducing inventory.

We can classify inventory into the following two categories from the viewpoint of the source:
① **Dead stock** that occurs because of mistakes, miscalculation, and engineering changes.
② **Operating inventory** that occurs in day-to-day production activities.

When analyzing the causes of **dead stock** further, we find many occurrences where multiple elements intricately overlap one after another and we cannot find any easy countermeasures. The answer to this problem will be "down-to-earth improvements."

TPiCS-X has a mechanism where the engineering information, including even engineering changes, is accurately, promptly, easily reflected in the production information. With this, half of this problem can be resolved.

Since the degree of accuracy of presumption is outside the scope of TPiCS-X, if there's any miscalculation, you have to find a way to minimize its damage. For that purpose to lessen the lot size and to shorten the purchasing lead-time are one way. However, this method has another problem for each of the changes. Refer to the separate booklet of "Solve the five difficult problems the manufacturing business faces with TPiCS" for those.

We can consider the **operating inventory** separated in two categories, too:
②-1 Inventory caused by the case where a person in charge of arrangement adjusts the quantity to purchase with "seat-of-the-pants" approach in order to handle possible changes.
②-2 Inventory that naturally occurs between the times of going into and coming out of the factory.

As for inventory caused by the adjustments to the quantity to purchase, TPiCS-X allows you to set up "a buffer to handle changes." Therefore, you are going to reduce inventory by changing your work relying on the "seat-of-the-pants" to the work controlled by the system.

As for inventory from ins and to outs, it can be controlled with the "delivery/manufacturing lead-times" and the "lot size."

With the state of the "Schedule Management" having been achieved, you can tell the critical point at which as much production as planned becomes impossible by gradually lessening these settings. As that's where the bottleneck for reducing inventory is, you are going to have to improve it.

## 5. Handling engineering changes and delays in releases of drawings.

The essence of the production control being difficult and

hard lies in "variations/changes." And the sources of them are "variations in quantity and period when presumptions turn into actual demands" and "engineering changes."
As there is the "CAD Data Convesion Option (described in 4. Reducing inventory)" in TPiCS-X, you can directly verify the changes with what has already been arranged and issue cancel and additional order forms in addition to the fuction where the engineering changes are reflected in the production information.

| Manufacturing Business *TPiCS-X* Applies To | | | | |
|---|---|---|---|---|
| | | Discrete Production | | Repetitive Production |
| Parts Intensive Type<br><br>Assembly, Food, Chemicals | ① Type | Manufacturing business dealing with industrial machinery and equipment. Manufacturing business dealing with production equipment, megacarriers, etc. | ③ Type | Manufacturing business dealing with mass consumer products. Manufacturing business dealing with automobiles, home electronics, OA equipment, etc. |
| | Key Function | Taking advantage of the structure information of CAD in terms of its design, TPiCS-X directly creates the Order data and allows the users to cancel them if there are any engineering changes. | Key Function | f-MRP tolerant of changes. More work of TPiCS-X users proves its excellence. |
| Process Type | ② Type | Manufacturing business dealing with parts peculiar, metallic molds, etc. | ④ Type | Material manufacturing business and material processing business. |
| | Key Function | Every time adding the Schedule data, the master data can also be added at the same time and they can be used elsewhere. | Key Function | As the purchasing status of materials is reflected in the production schedule, the users can build the production schedule, performing the simulation. |

# *TPiCS-X* Lineup

## 1. TPiCS-X Prices
Tax included.

### ① *TPiCS-X* (abbr. Tx)
**f-MRP Basic System** .............................. 1,050,000 yen
**Strategic Due Date Adjustment Option** ...525,000 yen
**Customer Order & Sales Mgmt. Option**..525,000 yen
**Manufacturing Number Option**.................525,000 yen
**One-item Production Option** ......................315,000 yen
**Automatic Leveling Option** ........................315,000 yen
**Traceability Control Option** ......................315,000 yen
**Shop Floor Control Option**.........................315,000 yen
**CAD Data Coversion Option** ......................315,000 yen
**Transaction Intensive Processing Option** 315,000 yen
**Internal Control Option** ...........................315,000 yen
**Quality Control (Serial # Ctrl) Option** ....315,000 yen
**Set Production Option** ................................315,000 yen
**Variance Analysis Option**...........................315,000 yen
**Due Date Reply Option**...........................315,000 yen
**Web Server Option**...................................315,000 yen
**Prod. Control Dashboard (w/ source prgrm)** .210,000 yen

### ② Operating License for LAN ......................105,000 yen

### ③ Foreign Language Version (English, Simplified & Traditional Chinese)
**f-MRP Basic System** ...................... 1,260,000 yen
* Same prices as Japanese version for each option.

### ④ *TPiCS-X* Small Business Pack............ 1,260,000 yen
**Foreign Language Version** .......................1,449,000 yen
* It's the functionally limited system due to the intentions of easier and less expenseive use.

## 2. Operating Environment
### ① For Client Server System
・ **Client** (PCs on which the MRP calculations are performed.)
OS: Windows 7, Vista, XP, 2000
* As for the hardware as powerful machine as possible is preferable since CPU and memory of the client are used for the MRP calculations. And a small capacity of hard disk is enough as only the system-related objects are installed in it.
・ **Client** (Other PCs for performing such as master maintenance, actual results entries, etc.)
OS: Windows 7, Vista, XP, 2000
・ **Database Server**
OS proven by our company: Windows Server 2008/R2, Windows Server 2003, 2000, Linux.
Database: Oracle 11gR1/2, 10gR1/2, 9iR2, MS-SQL Server 2008/R2, 2005, 2000, PostgreSQL

### ② For Web Client System
Browser: Internet Explorer, Firefox, etc.
OS for Web Server: Microsoft Internet Information Server and .NET Framework
Database: Shared with the clinet-server environment.

### ③ For Standalone System
OS: Windows 7, Vista, XP, 2000
Database: Oracle 11gR1/2, 10gR1/2, 9iR2, MS-SQL Server 2008/R2, 2005, 2000
Hardware: As powerful machine as possible is preferable since both the database and TPiCS operate on it.

### ④ Other hardware
There are no specific requirements but at least the environmental specifications the OS recommends are needed.

Refer to our home page for detailed information of compliant versions of operating systems and databases.

## 3. Network (LAN) Environment

In the case of the use of TPiCS in a network environment, the operating license fee of 105,000 yen will be required for each client.

For the C/S clients, most processing such as master maintenance and actual results entries is possible.

For the Web clients, entries for the customer order data and each of the actual results data, and inquiries for the schedule data and each master table are possible.

The auxiliary processing such as the MRP calculations and the calendar updates is only possible on the main client, but the number of it can be increased as needed.

### Example of the System Structure
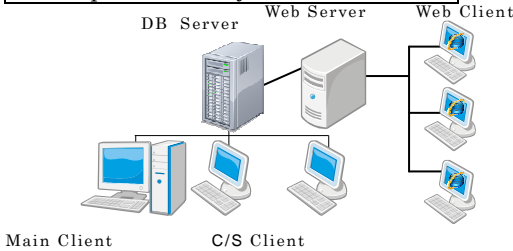


In this example the license fee for the six clients, and the Internal Control Option and the Transaction Intensive Processing Option used for the Web clients would be required.

If you only use the server and the main client, we will treat it as the standalone system. But if you are going to use more than one client afterwards, the operating license fee for the main client will also be required at that time.

## 4. WAN Environment (Terminal Server Service, Metaframe)
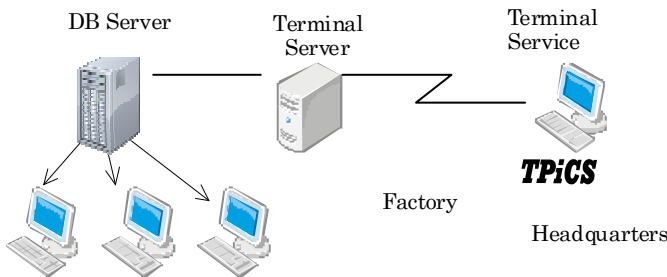


## 5. Applicable Scope

● Depth of levels for the parent-child structure
: Maximum 100 levels
● Length of the Part Number
: Configurable (Max. 100)
● Length of the Part Description, Customer Name and its Address
: Configurable (Max. 255)
● Length of the Remarks
: Configurable (Max. 255)
● Length of the Order Number
: Configurable (Max. 50)
● Length of the Mfg. Number
: Configurable (Max. 50)
● Target number of days for the production schedule
: Max. 365 days (buckets)
● Number of times to be processed for arrangements for one month
: Unlimited
● Number of parts to be registered for one product
: Unlimited
● Production locations for one item     : Unlimited
● Storage locations for one item     : Unlimited

Although the data volume actually operable varies depending on how to use TPiCS and the environment in which it is being used, you can consider the state, where the number of records registered in a table is approximately from 100,000 to 150,000 (approximately 50,000 records for the Item master), to be safe.

If you plan to operate TPiCS with larger volume of data, you should directly contact us for inquiries beforehand.

We will loan out a demonstration version (with all manuals) for free of charge. This version is limited to 50 records in the number of data to be able to be registered.
Also, you have the choice to purchase this version for 9,450 yen.

Windows, Microsoft Access, Visual Basic, and Microsoft SQL Server are the trademark of Microsoft Corporation.
Oracle is the trademark of Oracle Corporation.
Linux and PostgreSQL are the operating system and the database of which source code is open to the public.
The names of the other software are the trademark or the registered trademark of respective

# Framework of Implementation, Maintenance and Support

## 1. TPiCS Certified Instructors

"TPiCS Certified Instructors" who have passed the hard certificate test will teach you "in order for you to inexpensively, promptly, securely use TPiCS-X" according to the "TPiCS-X Implementation Instruction Program" we created based on the implementation experience for more than 1,650 companies. We are introducing the latest information of the certified instructors on the home page of our company.

## 2. Support

(The fee represents the case without the Maintenance Service.)

We will provide you with the support by phone, fax, and e-mail as described below: (Refer to our home page for details.)

● Regular inquiries: 10,500 yen/inquiry.
● Remote support: 31,500 yen/session (within 30 minutes.)
  * We will watch the same screen using the Internet.

● Analysis and verification keeping your data: 52,500 yen/incident.
● The support will be available only in Japanese.
## TEL: 03-5395-4228
## FAX: 03-5395-0056
## E-mail: support@tpics.co.jp

● 恩梯梯数据網藍軟件服務有限公司(Eastnet) will support in China.
Qualification  : Person who has registered on the below home page.
**Fee**   : Free (for the time of being.)
**URL**   : http://www.east-net.cn
**E-mail**   : xieliang@east-net.cn
**Shenzhen**
  **TEL:86-755-26982126 FAX:86-755-26982130**
**Shanghai**
  **TEL:86-21-5836-1591 FAX:86-21-5836-1815**
(The support will be available only by **e-mail** and **fax**.)

### 3. Holding of Workshops (The fee represents the case without the Maintenance Service.)

We hold a paid workshop every month at Sugamo in Tokyo. Also, the advanced and general system integrators of our partners hold paid or free worshops and introduction seminars as needed. Please join us on this occasion. (Refer to the TPiCS home page for scheduled dates to be held on.)

#### Workshop Curriculum in Sugamo Classroom

**Business Course (3 days)**                                       52,500 yen
**1st Day**: Operation method, Practical training, Detailed presentation of each function of TPiCS.
**2nd Day**: Detailed presentation of each function of TPiCS, Practical technique of master creation.
**3rd Day**: System operation in intial implementation, Presentation of each function of TPiCS Options, How to master TPiCS.
**Discrete Production Course (1 day)**                        21,000 yen
      Manufacturin Number Control, One-item Production, One-item Production linked with the CAD Data Coversion, Display, schedule and workload adjustments on the Gantt chart, Linkage with the Due Date Adjustment Option.
**System Course (1 day)**                                          21,000 yen
      Operation method details, System operation,, Custom settings.

### 4. On-site Support (The fee represents the case without the Maintenance Service.)

① **Problem Solving Service**
  We will resolve the problems that occur during the use of TPiCS.
 1. Approximation of the operation with TPiCS and user's work contents. Instrutions for business improvements to perform the "prompt, inexpesive, responsive but stable production."
 2. Consideration of customization, the development of add-on systems, etc.
 ・ Does the standard system of TPiCS have enough functions for your purpose?
 ・ Otherwise, will it be possible to conduct the business of your purpose by changing how to use it and your point of view for it?
 ・ If you develop the system, what kind of system would you like to develop?
 3. We will recover corrupted data due to some sort of trouble. (It excludes troubles with the hardware.)
 **Fee:**157,500 yen/day (Transportation and lodging expenses not included.)

② **Installation and Briefing of TPiCS**
  We will install the TPiCS system, create the database for it, and perform the environmental settings necessay for it.
  Normally we will finish them in a few hours, and we would like to briefly explain some functions in TPiCS using the rest of the day.
  **Fee:**84,000 yen/day (Transportation and lodging expenses not included.)

③ **Version Upgrade Work**
 ・ Installation of a new version.
 ・ Data Coversion.
 ・ Brief explanation of new functions.
 **Fee:**84,000 yen/day (Transportation and lodging expenses not included.)

④ **Consultation**
  Forming a business tie-up with TP-JIT Laboratory, we will be able to provide you with inexpensive consultation, and instructions and traings.

Contact: Komatsu, TP-JIT Laboratory
TEL: 046-221-1241 / E-mail: komatsu8@aqua.ocn.ne.jp

### 5. System Customization

TPiCS-X makes the following possible with the standard functions:
● The users can freely add items to each table in the database, display it on the screen, make entries to it, and print it on forms and orders.
● There are plenty of templates for such as the order sheet and the work order form, and the users can customize them for themselves.
● In order for the users to freely and easily design the forms they want for themselves, TPiCS-X has the system development tools (two systems of StiLL — Japanese version only — and OPRO) attached to it.
● All data can be read and written via the CSV file. So can be all transaction data via the "intermediate table."
● Almost all the processing of TPiCS-X can automatically be executed. A series of processing like "data import → calculation processing → writing the results" can be executed without intervention operaion to TPiCS-X.

The users can do these customizations for themselves but they can also ask one of the registered system integrators of TPiCS to do them for you.

### 6. Version Upgrade (The fee represents the case without the Maintenance Service.)

The costs for version upgrade will be equivalent to 30% of the standard price (one-fifth of the total price of basic system + options + license for LAN.)

### 7. Maintenance Service

There are three cources to meet your needs.
① **Annual Standard Maintenance**
  Free version upgrades.
  Free support by phone, fax, and e-mail.
  Free remote support using the Intenet.
  Free analysis and verification by keeping your data.
  40% discount of our workshops and on-site support.
  We will respond to your system improvement requests on a priority basis. (Paid service)
  Maintenance Fee: Equivalent to 15% of the standard prices per year.

② **Annual Program Maintenance**(It appies to the contracts through TPiCS system intergrators.)

30% discount of the above version upgrade costs.
Maintenance Fee: Equivalent to 10% of the standard prices per year.

③ **Annual Anshin Maintenance**(For the above Standard Maintenance.)

Four visits to your site by our staff per year.
Upgraded discount ratio (50% off) for workshops and on-site support.
Maintenance Fee: Equivalent to 30% of the standard prices per year.

【The standard price represents one-fifth of basic system + options + operating licence.】

# Discrete Production Function

In the case of the discrete production which is required to produce different products to meet customers' unique orders, it is not the type of operation where you can create master tables beforehand and perform uniformed processes like the repetitive production. Because of that, it was very hard to use the production control systems that forced you to create master tables beforehand. In order to resolve those problems, TPiCS-X has been creating fuctions and enhancing their functionality to be able to handle various manners of operations. Since you can use the fuctions of the repetitive production and the common functions descrived later to meet your operation, you can also respond to more detailed controls as well.

## 1. Use of the CAD Data

As the customers' needs have become divercified and the life cycle of commercial products has shortened, it has become more and more important to shorten the cycle from customer order to engineering design and to production even in the discrete production.

To make things in rapid cycle with that in mind, you should make arrangements for production using the engineering design information. However, there are many cases where the structure information (E-BOM) of products the engeneers think of is different from the structure information (M-BOM) the manufacturing department thinks of. It used to be common to turn it to the structure information for production, adding the judgement of men in the past. Then, when engineering changes occurred, the system was unable to directly reflect them in arrangements. People used to apply engineering change information to the structure information for production, comparing two sets of the structure information one by one in the past.
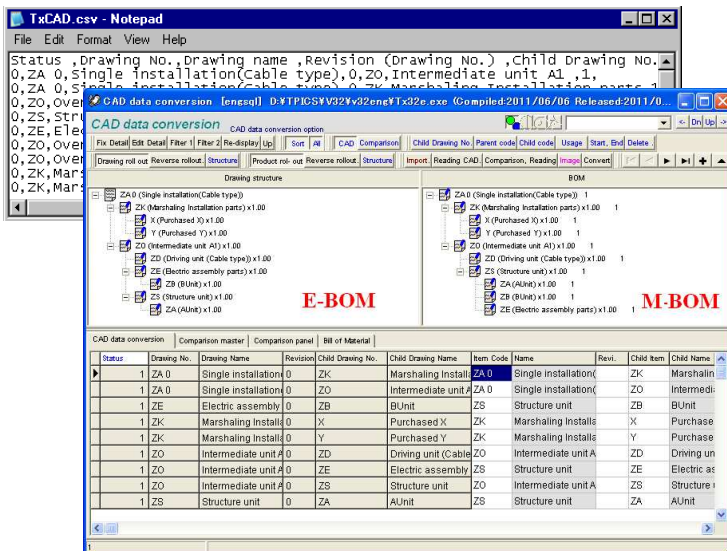


Using the "CAD Data Coversion Option" in TPiCS-X, however, even if there are some differences between the two sets of structure information and when engineering changes arise, you can make it possible to find out something unnecessary or something that needs an additional arrangement from the already arranged (purchased) data, and create cancel orders and new orders for additional arrangements with only some button clicks.

The production control work in the discrete production must become very easy and comfortable with this function.

## 2. Display and Schedule Change Function of the Gannt Chart

You can display the Gantt chart of which source data have been exploded and arranged, adjust the schedule by dragging it to right and left, and change the supplier and the production location.
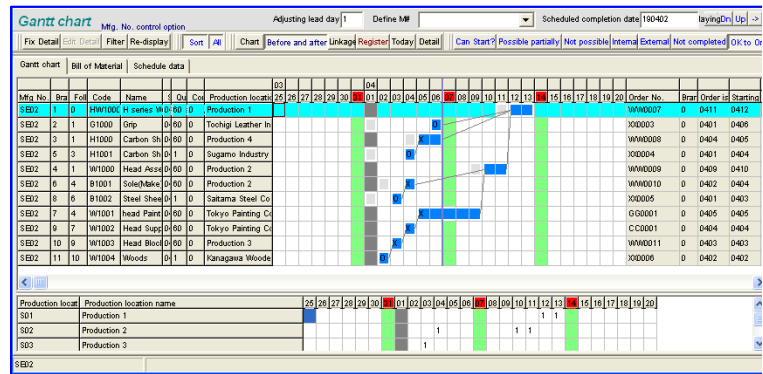


With the drag and drop of schedule, it can automatically adjust the schedule of related, previous and following processes backward and forward.

The results of the work volume at the bottom of the screen will change at the same time as the schedule changes.

Also, you can tell the status of previous process and the preparation of parts from this Gantt chart. Opening a new window, you can display a list of the status of each previous process. And you can tell what you can do now only by taking one look at the Gantt chart because it shows a "○" when all child parts are prepared, a "△" when only the partial production is possible, and a "×" when no production is possible. While the possibility of the previous process arranged with the manufacturing number is judged by whether or not the schedule of that previous process has been finished, it is judged by the availability of inventory as long as the previous process uses MRP-driven parts.

Also, since the schedule of which actual results have been reported to the system changes its color, the shedule with a color representing unfinished before today tells you it's been delayed.

At the bottom of the screen at the same time as the display

of the schedule is displayed the work volume (number of operations.) The calculation of the work volume can be done multilaterally (unlimitedly) by process, equipment, and other production resource.

Additionally, the TIF files and the DWF drawings written from the CAD, and the operating procedure manual in PDF can be displayed in the Gantt chart with a click of the button.

### 3. Use of the "Strategic Due Date Adjustment Option"

Connected to your partners through Web, you exchange the "Due Date Reply Requests" and the "Possible Due Dates" back and forth. As far as the operation goes, you automatically send messages and automatically receive them with a click of the button. When you import replied data to TPiCS-X and display the Gantt chart, you will immediately know where the problematic places are since they are dislayed in red if the replied due dates are after the following processes. When you correct one problematic place, you will see the due date change orders coming out one after another like a string of beads. It will take so much time and effort for you to inform each of your partners of them. The communication of due date changes is a bout with time. Too late communication makes due date changes impossible, and another due date changes will be required because of that. How promptly and accurately you can inform your partners of them is the key point here.

When you make the schedule adjustments using the Gantt chart, you will have the data for due date change orders created, and e-mail them as the Due Date Change data using the Strategic Due Date Adjustment Option. The troublesome work described above will be over with several times of mouse operation. You can transmit the change information to your partners all at once, and confirm the receipts of it by your partners without any omission. Using this function will make you wonder what the hell all your efforts were for after all.

### 4. Unnecessary Master Registration

Since the discrete production is intended to manage the "one-off production," you can make arrangements for production by only creating the manufacturing number schedule without registering master tables beforehand.

### 5. Creation of Quotation Request and Quotation Management

You can submit the Quotation Request before purchasing to your suppliers and manage the status of such as [Requesting Quotation], [Received Reply], [Retrieve the Most Inexpensive Quote], and [Purchasing].

### 6. Copying the Past Manufacturing Number

You can copy the manufacturing numbers in the past and create a new manufacturing number schedule.

### 7. Developing Certain Patterns of the Arrangement Data

There must be some kind of repeatability even in the discrete one-item production. Having registered some patterned structures, you can make significantly quick arrangements for parts by combining them, adding something to them, and deleting something from them by manufacturing number.

### 8. Generation Management of Change History

You can have the change history automatically created for as many as a specified number of generations.

### 9. Creating the "Bill of Materials Master" from the Arrangement Data

If something that was expected to be the one-off production turns out to be sold well and becomes the standard goods, you can create the bill of materials from the arrangement data with a click of the button.

### 10. Cancel of the Manufacturing Number

Should a deal not be closed, you can extract data with no actual results yet with a click of the button, and automatically issue cancel order forms.

### 11. Selecting a Processing Method for Already Arranged Items

When something of which arrangements have already been finished has become unnecessary due to engineering changes, you can select one of the processing methods for already-arranged items from such as issuing cancel orders and releasing manufacturing numbers with only the mouse operation.

### 12. Display of the Image Data

Not only on the Gantt chart but also on the entry screens of actual results, you can look at the TIF files and drawings of the DWF files created from the CAD, and display the PDF files. This makes it possible for you to perform the receiving inspection and the manufacturing, watching the drawings. The file formats possible to display are TIF file, PDF file, HTML file, URL file describing the hyperlink, JPG file, Bitmap, Metafile, and Extended Metafile.

### 13. Cost Control by Manufacturing Number

The actual costs will be displayed in contrast with the standard costs (budget) in real time. (Part of the actual costs may include the standard costs for unfinished schedules.) Therefore, you can take measures to make a profit in the middle of the production. And you can keep the data in another table to chronologically manage them.

### 14. Creation of Quotation

You can issue the "quotation" to your customers using data for the discrete production. Of course, you can define unit costs to be used only for quotation, and you can enter not only data to be used only for quotation but also even data that are not going to be reflected in any quotations even though they are strictly for quotation.

# Repetitive Production Function (usable for the discrete production)

f-MRP of TPiCS is the function to achieve the "prompt, inexpensive, responsive but stable production" based on the assumption that there's some degree of repeatability. As it has the concept of a buffer in addition to the functions in the existing MRP, it is the system very tolerant of changes in needs.

**1. Functions of TPiCS-X for the Repetitive Production**

① With TPiCS' own f-MRP function, the "prompt, inexpensive, responsive but stable production" can be achieved.

② It is possible to operate the system, making the schedule, where operation rates and bottleneck
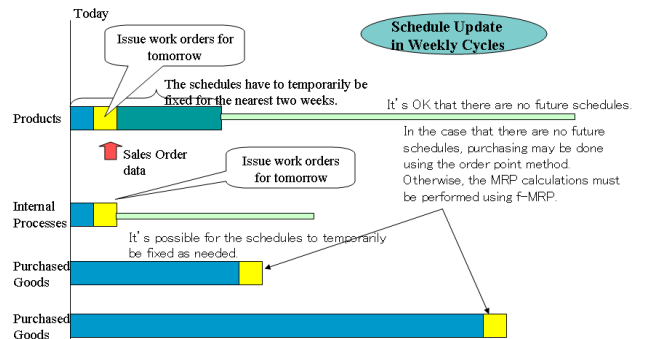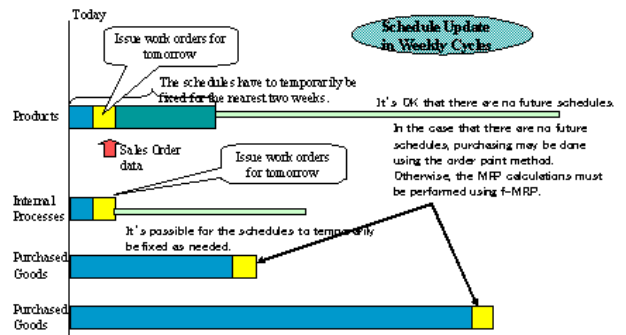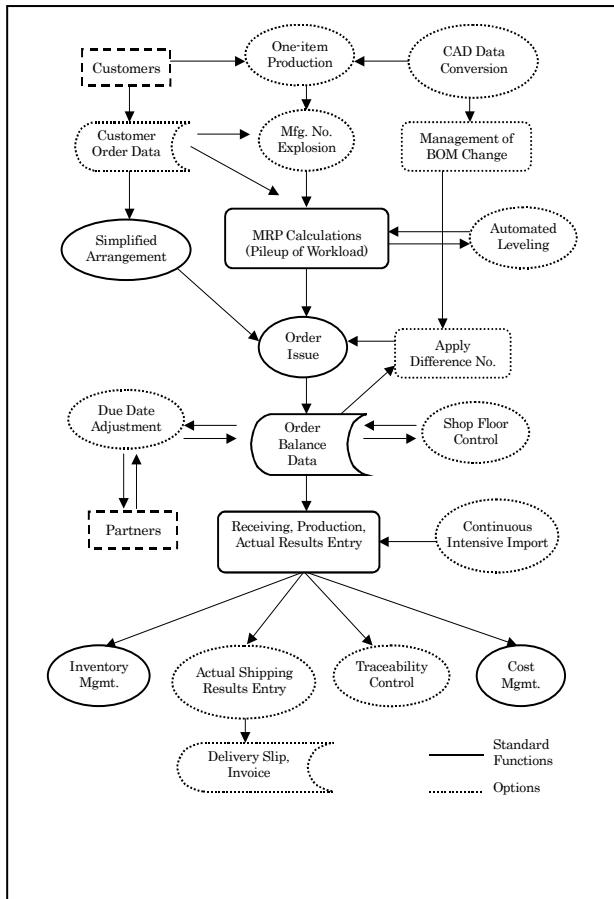




③ With the Automated Leveling Option, amount of work and loading rate will be tallied by parent-child level in the MRP calculations of TPiCS based on the calculation results at the time. If there's the loading rate beyond a setup value, the correspoing schedule will be shifted backward or forward.

The shift only occurs to unfinalized schedules. The MRP calculations for child parts under them continue based on the schedules after the leveling.

The shift of the schedules backward or forward due to the leveling will be absorbed by the function of f-MRP that is the biggest feature of TPiCS.

Whether or not to do the leveling and the standard loading rate will be set up by production line.

④ You can make arrangements for long-legged parts using the forecast data, and automatically delete the corresponding forecast data by creating their firm order data. The firm order data have fluctuation for

the forecast data. TPiCS-X processes it as a matter of course. You can perorm the MRP calculations for the mixed data that are different in nature like the "forecast data" in the future and the "firm order data" in front of them.

⑤ While you can perform the MRP calculations using the sales plan data and the forecast data, under the circumstance where there are no future data available at all you still can create a mechanism of the instant delivery system and the production for short-term delivery.

⑥ Handling customers' needs that change every day and considering due date postponement requests from suppliers, you can make the production schedule that should be feasible.

⑦ You can manage multiple storage locations, multiple production locations and multiple supply-to locations.

⑧ With the function of "Assumed Inventory," even if there are some defects and surplus production, you can not only control them to manually reflect them in the next MRP calculations but also let the system process them.



## 2. Master Registration and Maintenance Function

● With the distinctive "Mass Correction Function" of TPiCS you can instantly correct even large volume of data.

◇ Want to incorporate man-hour reduction in the standard hours because the period has changed.

◇ Want to reduce a unit cost of materials by material.

◇ Want to shorten the periods from purchase to delivery across the board.

◇ Want to adjust the standard inventory by group.

When you have plans such as the ones above, you are going to filter only the target data and enter, for example, the reduction rate, the system will do the calculation and replace the data with the calculated results across the board.

You can update almost all the items in a batch.

● Mass Copy Function
You can populate a lot of master records from the template data at a time by only entering the code and its name in the grid.

## 3. Item Master

● It may also be called the Parts master or the Commodity master, and you define parts and materials or processes to manage in it.

● You define the size for lot sizing (purchasing unit,) the standard inventory, the lead time, the work period for processing, the unit cost, the standard hours and such in here.

● You can do two levels of lot sizing and lot sizing for a limited period (for example, within a month.)
What is more, you can perform the calculation aheah of schedule to fit into a specified lot size.

● You can define different production conditions (lot size, lead time and such) depending on the production location.

● It has the learning function to automatically adjust the most important "standard inventory" of all the setting items used in the MRP calculations.

## 4. Bill of Materials

- You define the parent-child relationship and their quantities used here.
- You can define component parts with the drag and drop operation on the screen displaying the structure.
- You can define a different structure depending on the production location.
  For example, in the case of making the production using the same kind of parts both internally and at your partner's site, while your company makes arrangements for your own parts for the internal production, your partner makes the production using their own parts they purchase. You can perform the MRP calculations automatically using the different bill of materials depending on the production location.
- You can copy the existing structure to build the structure for a new product, and also build a new structure by combining the structures from multiple products.
- You can automatically create all the necessary master tables (the Unit Cost master, the Process master and such) at the same time as the Bill of Material data for multiple child parts.
- You can always display the structures from within all the major screens only with a click of the button.
- You can easily switch the display from normal expansion to reverse expansion and vice versa.
- You can define the quantity used for division.
- You can define the "Fixed Quantity Used" that won't be affected by the quantity produced.
- You can perform a batch replacement for child parts. This makes it easier to switch to the parts that have the same function with lower costs.

### 5. Unit Cost and Purchase Master
- You can define multiple suppliers, multiple applicable periods, multiple applicable quantities, and the unit cost for each of the above factors by part.
- You can purchase to the least expensive supplier who should meet the conditions of period and quantity at the time of purchase order issue.

### 6. Engineering Change Master
- Calculating the consumption time of inventory from the current inventory and the already-arranged quantity by only defining an old and a new part numbers, the system automatically switches to the new part number to purchase.
- The system automatically handles changes of the production schedule for products and the quantity of inventory.
- At the time of entries of the actual results for parents the withdrawals for their child parts that were used will automatically be done to new parts as well.

- You can directly specify the year, month and day in the Bill of Materials.

### 7. Split Purchase Master
- You define the split conditions here in order for a part to be purchased in parallel to multiple suppliers.
- You have to define the split ratio and the upper limit of quantity for each supplier under the conditions of period and quantity.

### 8. Production Schedule
The Production Schedule and the MRP Calculation Function.
- You can use the Production Schedule screen, where a part or a process is on the vertical axis and the number of operating days is on the horizontal axis, for the daily operation such as entering data and confirming calculation results.
- You can change the schedule and the production line with a drag-and-drop on the Production Schedule screen.
- While some parts must be ordered two months before, some may be received tomorrow if an order is placed today. The date columns for each item in the schedule of the grid view will change their color as follows: blue if there are some quantities that have already been purchased for that day, gray if there are some quantities that must be purchased on that day, and yellow if there's none yet to be purchased as of that day.
- You can display only the child parts to be used for a specified product.
- You can manage multiple production locations.
  Also, you can mange and create the schedule where you ask multiple outsourcing companies to do one process, and you make something in your production one time and ask an external company to make it another time.
- When you make something in multiple production locations, you work out the supply schedule for each production location and then you can issue the supply order form based on the schedule. You can also handle drop shipments.
- You can perform the MRP calculations, separating a number of groups like only certain products and departments.
- When you perform the MRP calculations in the network environment, in order to avoid an impact in response deterioration on other clients you can copy necessary data to another data area, perform the MRP calculations there using those data, and return only necessary data to the original database after the calculations.

# Common Functions
## (usable for both the discrete and the repetitive productions)

### 1. Order Issue Function
(1) Work Order, Purchase Order, and Transfer (Supply) Order
- Various order forms are issued based on the MRP calculations and the manufacturing number explosion or manual entry.

- Defining suppliers, periods, quantities, and unit costs that are different depending on the urgency in the Unit Cost master beforehand, you can have TPiCS-X use the period and the quantity, and retrieve the most inexpensive supplier to meet the conditions at the time of order issue (order data creation.) Then, you can eventually issue the purchase order form to the

supplier retrieved by TPiCS-X.

● You can use supplier's part number (catalog number and such) to purchase it.

● You can purchase to multiple suppliers in parallel.

● You can freely and easily customize the forms of orders.

● You can issue the order form with a list of required parts attached to it, and the dispatch order form with details of supplied parts attached to it.

● You can specify lot numbers for raw materials to be used on the work order form.

● You can issue the "Quotation Request" for the parts of which unit cost is unknown. By this function you can create the order form that is compliant with the subcontracting law.

● You can send the order form by e-mail.

(2) Issue of the Delay List

● You can print a list of delayed results but you can issue the List of Scheduled Receipts by supplier. It would show something of which delivery date is coming soon, for example next week, among already-ordered parts and materials.
This makes it possible to prevent delayed deliveries themselves instead of the handling after the fact.

## 2. Dispatch Control (Picking List)

● You can instruct dispatches from warehouses to factory floors.

● The calculation is done by item, dispatch source, and dispatch destination (plus by manufacturing number for the Manufacturing Number Cotrol items.)

● You can separately define the lot size for arrangements and for dispatches.

● If the current inventory is not sufficient for the required quantity to dispatch, the Dispatch List prints an indication of the insufficiency.

● When a part, which prevented it from being dispatched because of the lack of inventory, has been delivered, the next Dispatch List will automatically print it. Thus, you don't have to worry about a separate, annoying management.

## 3. Actual Results Management

(1) Actual Results Entry

● Processing materials to make finished goods and intermediate processed goods, inventory for the parents increases and inventory for materials decreases when the actual results for those are entered. The setting of "automatic withdrawal processing not allowed" and the calculation for consumed amount not linked to warehousing volume for parents are also possible.

● If the production goes as planned to some degree every day, you can register most of the actual results with a click of the button, manipulating only the other data for which the production didn't go as planned.

● The accounts payable ledger is populated from the data entered elsewhere.

● When the actual purchase unit price and the actual hours worked are entered, they will be recorded as the values of actual results.
(The moving-average method, the last cost method, or the gross average and gross price methods.)
This leads to the atual cost.

● Entering the actual hours worked by worker, work party, machine, and process, the total will be calculated by item described above.

● If important raw materials require an entry for the lot number at the time of receiving them, you can configure the setting so that its lot name is mandatory.

● You can specify which material (lot number) that was used at the time of entering the actual production results. You can view those data dating back at any time. You can record the manufacturing history from the time of receipt to the time of production completion (shipping) as needed. (Manufacturing Traceability Control Option)

(2) Inventory Control

● You can manage inventory in processes and supply-to's.

● You can manage multiple inventory locations.
By specifying a location to store in at the time of entering to warehouse and a location to take from at the time of dispatching from warehouse you can figure out how many parts exist in what warehouse.

● You can manage work-in-process inventory by received lot.

● You can display and print "stagnant inventory" ─ parts that have not been used during a specified period ─ with a click of the button.

## 4. Cost Control

(1) Cost Accumulation Table by Product

● How much amount each item has been produced for this month is calculated based on the actual results data and displayed.

(2) Cost/Profit and Loss Accumulation Table by Department

● Assuming what is used in the following process is sales amount, profit and loss by department are calculated and displayed.

(3) Cost Accumulation Table by Manufacturing Number

● You can compare the standard costs with the anticipatory actual costs including unfinished, predetermined costs.

(4) Recalculation Function of Unit Cost in Actual Results

● If the unit cost in the actual results should be calculated according to the moving-aveage method, you can have TPiCS reprocess all the actual results data in the order of date and recalculate it, starting with the value at the beginning of a month.

(5) Accounts Payable Ledger (Accounts Payable Detail)

● At the time of the Actual Results Entry you can enter the material cost, the hours worked, and the supplier, which will be reflected in the accounts payable ledger.

● You can manage both paid and fee supplies.

● You can both enter and correct the actual results data for previous month after the close depending on the setting.

## 5. Load Calculations and Workload Schedule

● You can graphically display workload (load, pile of work) by process and day, and print it as-is.

● If you manually adjust the leveling, you can easily change the schedule with the drag and drop on the production schedule and the Gantt chart. Also, you can automatically reflect the results of the changes in the Workload Table at the same time as the changes.

## 6. Data Retrieval, Filtering and Sorting Functions

● You can easily perform data retrieval on all items (including user-deifined ones) of all screens.

● Since TPiCS memorizes the conditions for data filtering, you can display only the data of your own work in charge at any time.

● You can filter data on multiple items using the operators of such as "AND," "OR," and "NOT."

● You can sort data on all items for all screens with a click of the button.

● As you can customize the sequence of items in grids, you can move some items that you don't usually use so much to the end of the grid.

● You can easily build your operating environment where there's a limitation only to the functions to be used every day.

## 7. Operation Calendar

● You can add 30 kinds of calendars at the maximum that have different off days and work hours.

● You can manage day and night shifts (maximum 24 shifts.)

● You can set up calendars to be used by factory and process.

● You can create a variety of schedules, fine or rough ones. For example, the shift would be a mixture of day and night for this month, by the day for next month, by the week for the month after next, and such.

## 8. Adding Items

There are good things and bad things about the customization of packaged software, but in general there always seems to be a possibility that bad things are overlooked.

I've been working on this job for more than 20 years, and seen a bellyful of big and negative effects by the customization.

Therefore, when I developed TPiCS-X, I considered how to develop the system of which customization was impossible (unnecessary) if you wanted it. Analyzing the situations of the customization by the TPiCS users, I found a lot of cases where they made a great deal of customization and fell into a bogged-down situation in order to add items TPiCS (the packaged system) didn't have, to enter data to them, and to print them.

So, I made it possible for the users of TPiCS-X to perform such tasks as adding items freely, providing input areas for those items on the screens of TPiCS-X, and printing/writing them to the priter/text files with easy operation. Also, you can print additional items the users set up in the master tables on the forms.

## 9. Screen Design Function for Input Area

Most production control systems have a tendency to contain so many items in each table by any means.

They display all those items on the screen and make the users enter data to them, but there must be a lot of items unnecessary for the users.

TPiCS-X allows the user to move unnecessary items to the end of the screen, and even to configure the sequence of the tabs. Thus, it allows him/her to adjust the screens that are easy to operate for himself/herself.

## 10. Handling of RoHS Directive and Law on Promoting Green Purchasing

If you register the contamination status of such as the "specified hazardous substances" indicated in the RoHS Directive and the "specified procured goods" indicated

in the Law on Promoting Green Purchasing at the time of material purchase, you can determine whether or not the finished goods are green by exploding the bill of materials in reverse.

## 11. Interface Linked to Other Systems

TPiCS-X provides you with a wide variety of integrated functions based on the past results where it had been integrated with many systems.

● **You can import/export all data from/to the CSV text files.**
 Since the import format contains the header line that represents the item names, you can freely change the sequence of the items. And as for the item names, you can freely define them by creating the conversion table.

● **You can execute the major functions of TPiCS-X, using the instructions defined outside TPiCS-X.**
 Besides a way to control with the COM interface, there's another way to import the script file that describes the processing to be executed.

● **You can get straight to a processing screen of TPiCS-X without activating the menu of TPiCS-X,** and manipulate it as if it were part of other application.

● **You can process almost all transaction data via the intermediate table, using the Transaction Intensive Processing Option.**
 You can import the intermediate table at a specified interval (timer job.)

● **Even manual operation** only requires several clicks of the button to execute the daily routine processing.

## 12. Integration with the ERP Systems

● Placing an interface between the ERP systems and TPiCS-X, you can achieve pseudo real-time integration by sending and receiving trasaction data of each other.

● The customer order data entered to the ERP system become those in TPiCS-X at once. TPiCS-X, then, peroforms the MRP calculations using those data, and issues the purchase order forms. When the actual delivery results from suppliers are entered to TPiCS-X, the purchase journal data will automatically be created in the ERP system.

● Refer to the page of "Integrated Systems" for the integrated ERP systems.

## 13. Integration with the General Ledger Systems

● According to the "journal data import format" for almost all the general accounting systems for personal computers, TPiCS-X can export data from the Accounts Payable Detail and the Accounts Receivable Detail.

● Refer to the page of "Integrated Systems."

## 14. Integration with the Sales Management Systems

There are some integration methods provided:

● Integration method where TPiCS-X performs the MRP calculations, directly using the customer order data and the inventory data in other Sales Management system.

● Integration method where other Sales Management system exports the customer order data to the CSV file, and the Customer Order and Sales Management Option of TPiCS-X imports it.

● Integration method using the above ERP Integration functions.

● Refer to the page of "Integrated Systems."

### 15. Integration with Schedulers and Microsoft Project

● You can send and receive the schedule data between generic schedulers or Microsoft Project and TPiCS-X.

● Refer to the page of "Integrated Systems."

### 16. Free System Development Tools Attached to TPiCS

The following two development tools will be attached to TPiCS-X for free of charge as a gift.

● **With the development tool called "StiLL" using Excel**, you can import data in TPiCS-X to Excel, process and analyze them, and print them on a form and as graphs.

● **Using the form creation tool called "OPRO,"** you can print the form you created off the button in TPiCS.

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## Functions for Food/Chemicals Mfg. Industries

● TPiCS-X has the concept of batch. When displaying the bill of materials (table of ingredients, recipe,) the actual results, and inventory, it allows you to enter and display something, converting the units like from batch size to kg and vice versa.

● It allows you to freely use a variety of units in combination such as kg, bag, liter, and such. Also, you can define the number of digits after decimal point by raw material.

● It allows you to issue the purchase order form and such displaying figures in converted units.

● It allows you to enter the "actual input value" and the "actual measured value" separately at the actual results entry.

● It allows you to perform automatic withdrawal using the "actual input value" for input raw materials and the "actual measured value" for packing materials and such.

● It allows you to manage items by the exiparation date, using "List of Expired Items by Lot," the usage restrictions of expired raw materials and such.

● It allows you to perform the MRP calculations, considering the expiration date.

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# Strategic Due Date Adjustment Option

### 1. Overview

While companies on the purchasing side use TPiCS-X with the host program of the Strategic Due Date Adjustment Option, companies on the parts supplier (vendor) side use the terminal program of the option.

Companies on the purchasing side perform the MRP calculations using TPiCS-X and send order data by e-mail through the host program.

And the other side automatically receives them through the terminal program, goes through due dates on the terminal program, and send back the due date change requests if there are any orders of which due date cannot be kept (should be put off.) The host program, then, can automatically receive the due date change requests from multiple vendors.

It is simply the "function to transmit order data on the Web" so far but **from here is going to be described the true value of TPiCS-X.**

The companies on the purchasing side have to judge whether or not a lot of due date change requests they have received will be acceptable, also determining whether or not they can handle new orders and changed orders from their customers.

When it is used together with TPiCS-X's primary function of **f-MRP** and the MRP calculations are performed, the Strategic Due Date Adjustment Option is able to solve the problems all together.

If there are any problems found in the due date change requests, they will try to find them and ask their vendors for the review, or "ask their customers for due date changes."

Since the **f-MRP** calculations of TPiCS-X perform the calculation with a "buffer to the fluctuation," they will judge there's no problem at all if due date change requests from vendors and the fluctuation in orders from customers are "within the buffer," and only list something "beyond the buffer."

The users have to decide whether to ask their vendors for the review or to "ask their customers for due date changes" based on the output list.

There can be two settings for the "buffer to the fluctuation;" the "standard inventory" set for computed inventory in the future and the "allowance for the delivery lead time" set for the delivery lead time from the day parts are delivered till the day they are actually used. Furthermore, since the terminal program allows the users to reply in such a way that one order can be delivered in multiple times as the partial delivery schedule, the operation not to unnecessarily stir up the schedules of companies on the purchasing side is possible.

The terminal program can be used in liaison with the main body TPiCS-X, and if companies on the parts supplier side also use TPiCS-X, they can perform the MRP calculations and find out orders that have a problem with the delivery date.

Furthermore, since they can use the host program as well, they can reply due dates, considering the supply situation for grandchild parts.

Meanwhile, since the regular e-mail (POP3) is used for e-mailing, you can build the system very easily.

### 2. Operating Environment

(1) Host Program
   TPiCS-X Version 3.1 or later, and the environment where TPiCS-X is operable.
   Dedicated mail address.

(2) Terminal Program
   Windows 7, Vista, XP, 2000.
   Dedicated mail address.
   No other databases are needed since the MSDE is to be provided.
   Standalone use is possible as well.

### 3. Terminal program

① The terminal program of the Strategic Due Date Adjustment Option is the system you can use free of charge.
   As far as the demo version of TPiCS-X is concerned, all the functions will be executable if the number of records registered in the Item master is 50 or less, but only the functions of the terminal program will be available if it exceeds 50.

That is, the MRP calculations, the registration of the Bill of Materials, the customer order entry, or the manufacturing number explosion will not be available if there's only the terminal program available.

②How to get the terminal program.

**Method 1:** Ask TPiCS Laboratory, Inc. for a loan-out of TPiCS-X's demo version free of charge.

You can still use the demo version after the loan-out period of three weeks, and a return of the manuals.

**Method 2:** Ask one of the host program users to pass it out.

We give one disc to them for 1,000 yen.

**Method 3:** Get it from one of the registered TPiCS system integrators.

**Method 4:** Purchase a demo version of TPiCS-X for 9,450 yen.

③Support of the terminal program.

Please send your inquiries off "Maintenance Service & Support"-"Support Inquiry Form" on the homepage of our company.

④Version Upgrade.

You can upgrade your terminal program together with the version of your host program user.

⑤User registration.

When users of the terminal program become the registered user, an ID and its password dedicated to the user will be issued, and be able to:

(1) Download manuals and the latest version from the home page.

(2) Receive the TPiCS reports.

The user registration will be done through the user of the host program, or by sending the below user registration form, with the user name who uses the host program clearly specified, to us.

Please download the "User Registration Form for the Terminal Program" from our homepage.



# Shop Floor Control Option

## 1. Overview

This is the system to perform the process control of the factory floor, and it intends to be used by those who are thinking as follows:

"When giving instructions to the factory floor, we'd like to submit the schedule with a proof of a pile of loads to them since they complain about the inability to control the workload."

"Since people on the factory floor do it their own way, things get out of control. We'd like to be able to manage things somehow using computers."

"Time and effort for the setup vary depending on the order of things to be produced. We'd like to build the schedule with as little time and effort as possible."

"We have multiple machines in each process, and their performance is a little different from machine to machine. There are some we can make, and some we can't make depending on the product we are going to make. We'd like to build as efficient schedule as possible in those situations."

"When we receive an inquiry of delivery date from one of our customers, we can't give him/her any answers without going to the factory floor in each case. We'd like to be able to know that by just looking at the screen of a computer."

"Although we use one of the MRP systems for arrangements of parts, we can't improve a can of worms, or handle demand fluctuation as a result of it. In order for our company to respond to the age of rapid change from now on, we'd like the system to promptly build the in-process schedule with a proof of available parts.

The Shop Floor Control Option is not such a system as human-beings going the rounds of wiping off the "butts" of "actual results" in order to reflect the actual results. The movement of things gets data going and the data get the things going. It is the system to make people on the factory floor able to see the moving data in real time, and to make a right decision.

## 2. Functions of the Shop Floor Control Option

●It operates on a personal computer placed on the desk of the foreman or the section leader of the factory floor, or the person in charge of the shipping location in a LAN environment where TPiCS-X is operable.

● Upon power-on of the personal computer, a list of today's and tomorrow's work will be displayed on the screen of it.

 (The important thing is to limit the display to a few days of work.)

● As soon as the schedule is changed on a personal computer of the office, the change will be reflected in the screens of all other people.

● Something of which required parts are insufficient, something of which previous process is unfinished, and something which can be started at any time will be displayed so that you can recognize it at a glance.
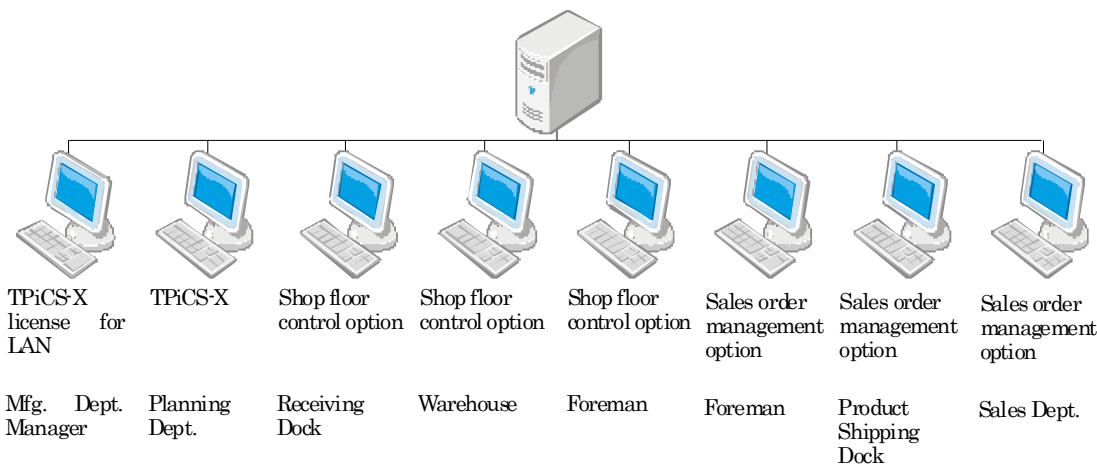
 The screen displays the sorted result of order of priority so that you can start with something urgent.

 Upon click of the Prev. Process button at the screen displaying the data that are unable to start, what processes and child parts are insufficient, and what the corresponding schedules look like will be displayed in a window.

● You can clearly specify the daily production level (quota) aside from the MRP calculation result.

 So, you can hold down the request level of the leveling for the production schedule by this.

● Determining what operation should be started next from that screen, you are going to press the Start button. Upon press of the Register button when it is completed, you can perform the actual results entry.

● Upon click of the start button, you can even tell what time the previous process was started at by looking at the following process.

● An entry to the actual results makes it disappear from the screen of schedule instructions.

 On the other hand, it won't disappear from the screen without an entry to the actual results.

● Since the display of operations to do uses different colors according to work contents and work methods, you can determine the efficient order of operations, choosing operations with similar colors and considering their setups.

● When the actual results are entered on the screen of the Shop Floor Control, they will be reflected in the inventory quantities of TPiCS in the office in perfect synchrony.

● The actual results entered at the previous process will immediately be reflected in the screen for the following process of the Shop Floor Control, and the indication in red will be gone from the screen.

● You can print the daily report for today and the balance list from a personal computer in the office in the evening without bothering anybody.

The Shop Floor Control Option is not the system directly responding to the needs appearing on the surface but the system aimimg to resolve the problems behind those needs, or to remove a can of worms leading to the problems and to perform a true "management" "soil improvement-wise."

When you look at the actual behavior of the system with the above needs, you'll find the system to be something like you could feel like "the scales fall from your eyes."

| TPiCS-X license for LAN | TPiCS-X | Shop floor control option | Shop floor control option | Shop floor control option | Sales order management option | Sales order management option | Sales order management option |
|---|---|---|---|---|---|---|---|
| Mfg. Dept. Manager | Planning Dept. | Receiving Dock | Warehouse | Foreman | Foreman | Product Shipping Dock | Sales Dept. |

● The planning department performs the MRP calculations of f-MRP based on the Customer Order Shipping Schedule data entered by the sales department, and calculates the production schedule for products followed by the manufacturing planning for each internal process and the purchase planning for parts and materials.

● The schedule for parts and materials   inorporating planned fluctuation is calculated and made by f-MRP, and the order forms are issued based on the schedule.

● The instructions to within the company are given by the schedule with a proof of available parts and materials and including the nearest few days being written to the Actual Order Balance Results data.

● All the foreman has to think of is to finish the operations displayed on the screen of the Shop Floor Control.

 He can get rid of all other things he has done leading to this state.

 In short, he won't get upset any more about scrambling schdule changes, worries about parts, previous and following processes, convenience of his customers, and such.

 All he has to think about is his subordinates, equipment and contents of work.

● In this operating example the system price of TPiCS will be as follows:

 TPiCS-X (1,050,000 yen) + Shop Floor Control Option (315,000 yen) + Customer Order & Sales Management Option (525,000 yen) + Operating License (105,000 yen) x 8 = 2,730,000 yen.

# Manufacturing Number Control Option

## 1. Overview

The Manufacturing Number Control Option has three manufacturing number schemes:

① Manufacturing number control by traditional concepts (b-seiban.)
② TPiCS' own control method (f-seiban.)
③ Something to manage, tied to the Customer Order data ( j -seiban.)

TPiCS-X provides you with very advanced functions in the manufacturing number control as well.

● Lot-sizing is available.
● Automatic inventory allocations are available.
● TPiCS-X allows you to automatically allocate the manufacturing numbers to the Order Balance data that are being arranged.
● You can automatically release/re-allocate something insufficient and sufficient due to defects and good yield ratio from/to the manufacturing numbers.
● There's the function to transfer (replace) the manufacturing numbers.
  You can replace other manufacturing numbers assigned for not only the parts but also the units, which have been arraged with those manufacturing numbers, with new manufacturinthey numbers you have to complete as soon as possible. For example, if I may liken parts to leaves of a tree, you could replace them with other manufacturing numbers branch by branch.
● You can perform the explosion for the (real) manufacturing numbers for parents, allocating the units arranged with the manufacturing numbers for precedent arrangements (prepared manufacturing numbers.)
● It manages revisions so that you can select inventory to be allocated, looking at the revision.
● It becomes the base of the One-item Production Option.

## 2. Structure Change Function

● There are two ways prepared to change the product structure by manufacturing number.
① Method to use the Option Code.
  Defining parts in the bill of materials as options, you can specify those options to be included in the manufacturing numbers at the time of manufacturing number explosion.
② Method to change the structure after manufacturing number explosion.
  You can change the structures after the manufacturing number explosion with easy operation of the drag-and-drop. You can easily perform additions and deletions by manufacturing number at any time.
  You can change only the data of a specific manufacturing number without having an impact on any master tables.
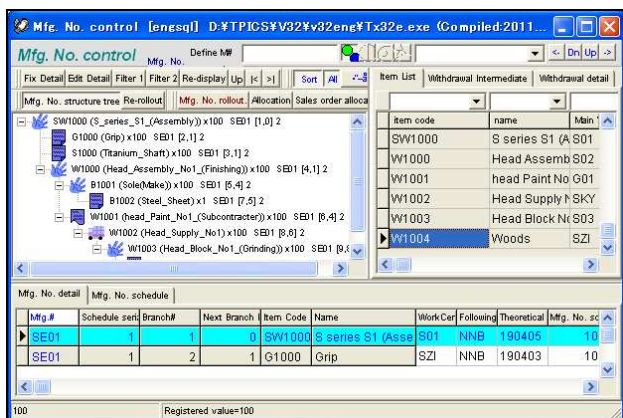


## 3. Function of Cost Accumulation by Manufacturing Number

● Calculating unfinished work as the predetermined costs, you can manage them in contradistinction to the standard costs.
● Saving the costs in the past, you can refer to them afterward. (Traceability control of cost.)
● The parts that have gone through the f-MRP calculations can also be included in the costs by by manufacturing number.

## 4. Gantt Chart Display Function

● The progress status of child parts and each process associated with the manufacturing numbers can be displayed.
● You can tell at a glance whether or not the previous process has been finished, or inventory for the MRP parts is available and they are consequently possible to start now.
● With the drag-and-drop operation you can change scheduled dates, suppliers, and production lines.
● You can issue the changed order form for what has been changed, and automatically send the changed detail to parts and outsourcing suppliers by e-mail if this is integrated with the Strategic Due Date Adjustment Option.

# One-item Production Option

## 1. Purpose

This is the function to predict the case where the specification changes at every customer order because of the "one-time production" and you can operate the system without defining some master tables.

## 2. Overview

① Registering the contents of work and used parts in each case with a very high operability, you can make arragemets.
② You can make a copy of a similar manufacturing number in the past to use it for modification.
③ Releasing the drawings continually, you can start making arrangements for what is necessary and what is possible among them.
④ If it is possible to develop a certain pattern to some degree, you can use it as the base of modification.
⑤ By integrating it with the "CAD Data Conversion Option," you can seamlessly make additions, changes and deletions due to the engineering changes, and promptly reflect them in the arrangements.
⑥ You can use general-purpose units and parts that have repeatability.
⑦ You can issue the "Quotation."
⑧ You can issue the "Quotation Request Form," and do business based on the subcontract act.
⑨ You can manage parts becoming unnecessary due to engineering changes and such, and divert them to other projects.
⑩ You have to purchase the "Manaufacturing Number Control Option," too, to make the One-item Production Option work.

# CAD Data Conversion Option

## 1. Purpose

Getting the "product structure information" and the "engineering change information" of the design from CAD and Microsoft Excel through the CSV file, you will apply them to the production information in TPiCS. As one CSV file makes it possible to process the integration, you will promptly reflect them in the production without any omission of engineering changes.

## 2. Overview

● You can define work, which is not defined in the BOM for the engineering such as supplies and outsourcing processes, in the BOM for the production.

● Even after the BOM for the engineering and the BOM for the production are separately defined, you can promptly reflect engineering changes in arrangements.

● The portion that has an engineering change is displayed with the status and in color, which prevents it from being overlooked for the processing.

● If you use this in combination with the One-item Production Option, you can seamlessly reflect engineering changes in the arrangement data.
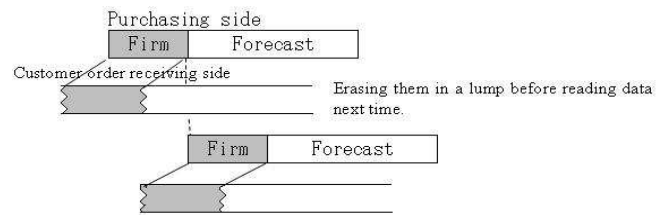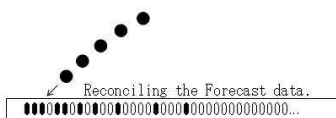
# Customer Order & Sales Management Option

## 1. Overview

① The following forms can be issue from this option: Shipping Tickets, Delivery Slips, Invoices, and Accounts Receivable Statements.

② You can make arrangements for parts and materials based on the forecast schedules by integrating them with the f-MRP fuction. Even if they change, you can take them over as they are to the next MRP calculations because they are based on the function of f-MRP.

③ Creating the shipment planning of TPiCS from the customer order data, you can perform the MRP calculations as it is.

④ You can print the Customer Order List, the Scheduled Shipments for a specified date, and the Delays in Shipment List.

⑤ You can directly import the customer order and delivery instruction data coming through the Internet.
The imported file has to be the CSV file format.

⑥ This option can completely handle the daily delivery instructions.
Importing the firm customer order data, you can delete the corresponding forecast data.

⑦ You can also have a choice not to reflect backorders in the production schedule.

⑧ You can handle the form of taking customer orders for the all-optional-parts (assemble-to-order) production .
You can paste parts and units that you are going to use in each customer order with the drag-and-drop operation.

⑨ You can enter customer orders for any level of the product structure. With this function, you can manage OEM shipments and parts for repair at the stage of intermediate products and parts. Adding the required quantities for those, you can perform the MRP calculations.

⑩ You can manage the cash receipts like reconciling an individual sale.

⑪ It has an interface to perform the MRP calculations, directly using the customer order data and the product inventory of other Sales Management systems.

## 2. Handling of the Forecast Data

① In the case of sending the firm delivery order data every day like the automobile industry, you can import them, reconciling the forecast data in the order of the forecasted delivery date by item and delivery location.


Reconciling the Forecast data.

② You can process both firm and forecast orders.
You can periodically delete the forecast data, and re-import new data.



Purchasing side
Firm    Forecast
Customer order receiving side
Erasing them in a lump before reading data next time.
Firm    Forecast

# Automated Leveling Option

## 1. Purpose

● "We'd like the schedule to be smooth by bringing forward the customer orders that flock to the end of the month by any means." "We'd like to make the schedule only some of which bottleneck processes are leveled off." This option handles the above needs.

● You can perform the leveling process for the "leveling production" for the auto parts makers.

## 2. Overview of the Leveling Process

① The leveling process is performed in the MRP calculations of TPiCS.

② The workload and the loading rate are tallied by parent-child level in the MRP calculations based on the calculation result as of then. If any of the loading rates exceeds a specified value, the schedule in question is shifted backward and forward.
Only unfinalized schedules are subject to the shifting.
The MRP calculations continue with child parts under it based on the schedule after the leveling.

③ "Backward shifting" and "forward shifting are possible.

④ Necessity or unnecessity of the leveling and the standard loading rate can be set up by production line.

⑤ The target items are defned in the "Leveling Priority" of the Item master.

⑥ The process for the leveling production is also calculated by parent-child level.
The schedule for the equalized production is made by item and week after inventory allocations and backward calculations of the lead times. The schedules for the items of low-volume production are calculated and made as early in the week as possible.

before leveling



after leveling
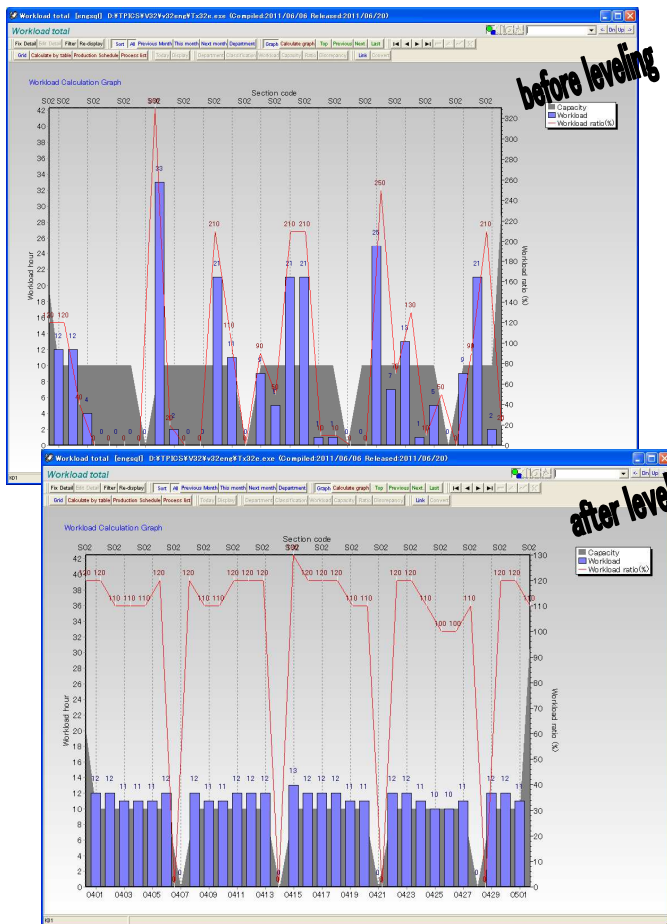
# Manufacturing Traceability Control Option

## 1. Purpose

This is the option that provides the tracing functions of     lot and traceability control for raw materials required by ISO9000, PL Act, Pharmaceutical Affairs Act, etc.

Once you enter the lot numbers of manufacturers at the time of the receipt of raw materials, you can register raw materials used or work-in-proces inventory used as you go through internal processes.

Also, you can manage the expiration date.

## 2. Overview of the Traceability Control Function

①You have a choice (setting) to enter the lot numbers for raw materials at the time of their receipts as required. ("Mandatory" is definable.)

②If you enter the actual results for internally processed goods, you can associate internally registered lot numbers with the original ones for raw materials used.

If there's something that requires the traceability control among raw materials used, TPiCS-X automatically allocates inventory according to the "first-in first-out" first. Then, as a window opens for you to confirm the detail information of automatic allocations, you can correct it as needed and register it.

③While one product or process can use multiple lots of raw materials, one raw material can also be used by multiple products or processes. In other words, many-to-many relationships are processable.

④After the receipt of raw materials, you can manage all in-plant

transfers such as dispatching a portion of them and returning it to the warehouse.

⑤Since you can tell the purchase prices of raw materials used, and workers and hours worked of the operations, you can tell the respective net cost of each produced lot by the "Cost by Lot" form.

⑥For raw materials and goods in process that require the "expiration date control," you can print a list of goods approaching their expiration dates and execute the processing for scrapping them in a batch. Additionally, you can reflect the state, where you may have to scrap raw materials and goods in process in the future, in the MRP calculations.

⑦You can instruct someone about "raw materials to be used" on the work order form. The specified raw materials will temporarily be allocated and automatically be withdrawn at the actual completion results entry for their parent. You can change raw materials to be used along the way.

# Internal Control Option

## 1. Purpose

This is the function to make the risk management possible by preventing illegal activities and unauthorized use and keeping business rules within the production control operation.

## 2. Overview of the Internal Control Function

①Only the "Configuration Administrator (a person who has a special hard key)" is allowed to do the settings related to the Internal Control in the [System Configuration Settings.]

For example, nobody else but the above person is allowed to change the setting of "Anybody can correct the actual results data that has once been entered without using the function of reversal order processing" on his/her own.

②Change history for all tables can be written to the dedicated data area.

The user can specify change information of what tables to be written.

③Only the data the "authorized person of purchase order approval" has approved can be subject to the issuance of the purchase order forms.

A special setting identifies the "authorized person of purchase order approval."

"Approver," "Date and Time Approved," and "Approved Key (cipher)" will be written to the approved data, and the approval will become invalid if the purchase order is changed after approval.

## Lower-of-Cost-or-Market Method

The evaluation of inventory value may be based on the Lower-of-Cost-or-Market Method that is part of the standard feature in TPiCS-X Version 3.2.

①Last cost of the actual receiving results data for raw materials and purchased goods.

②Applicable purchase unit cost of the Unit Cost master at the end of the period.

Using the lower unit cost of the above in the existing actual results, you can roll up the unit cost for units, goods in process, and finished goods.

And, if necessary, you can reflect the calculated result of final hours worked times processing cost rate of the actual work completion results in the above unit cost.

Furthermore, comparing the cost to the selling price, you can consider less expensive one to be the "lower cost," and evaluate the physical inventory.

# Quality Control
## (Serial No. Control) Option

### 1. Purpose

This is the function to be able to easily enter the inspection result and to eliminate any omissions.
Also, entering the inspection result piece by piece, you can achieve the serial number control.

### 2. Overview of the Quality Control Function

①You can register the form design of a number of inspection forms and the screen design of the actual inspection results entry corresponding to that form design. A prototype of the screen design is automatically created based on each form design, and you can create it with some adjustments in accordance with a final screen.

②You can specify the inspection form design by item.

③When issuing the work order form, you can issue the specified inspection form at the same time.

④When entering the actual inspection results, you can have the actual work completion results or the actul receiving results automatically generated.
On the contrary, when entering the actual work completion results, the actual inspection results entry screen similar to the inspection form automatically opens. You can enter the inspection data there.

⑤The inspection record is generated at the same time as the actual work completion results entry for the items of which inspection setting says mandatory, That will prevent an entry to the actual inspection results from being omitted.


# Set Production Option

### 1. Purpose

This option allows you to make adjustments to the schedules for multiple parts or products specified as a group at the same time and at all times.

### 2. Overview of the Set Production Function

①For example, if you processed different parts on the sides of something in a single mold, you would have to produce the same quantities of them regardless of the quantities of customer orders at al times. In this case you can make the same schedules with the same quantities in the MRP calculations.

②If a by-product is generated, you can have the schedules for multiple products made at the same time with a specified ratio.

③When changing the schedule of the production schedule with the drag and drop, you can always change the schedules for the items that have the same set production group specified all together. And you can simultaneously reflect the result in a pile of workload.
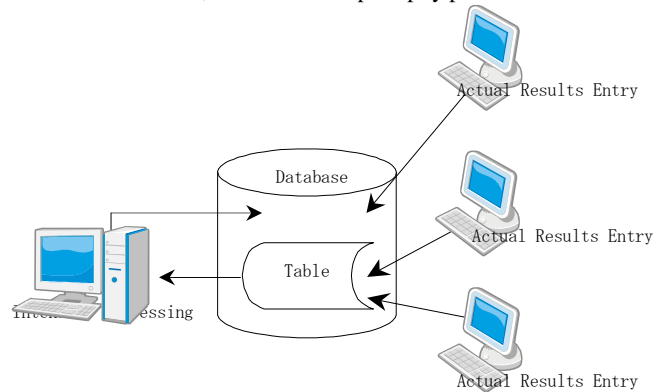

# Transaction Intensive Processing Option

This opton has three different uses as follows:

**Use 1:** One personal computer concentrates on such entry processing as the actual production or receiving results, the actual dispatch results, the inventory transfer, the actual shipping results, the customer order data, etc.

Each client the actual results are entered on writes the entries to the "intermediate table for import" on the server depending on the setting.

The Transaction Intensive Processing function constantly keeps watching the "intermediate table for import," and processes one right after the other if it finds any data.

By this function, even if a lot of clients intensivevely take care of actual results entries, each client can promptly process them.



**Use 2:** It acts like an interface to integrate TPiCS with other ERP and Sale Management systems in pseudo real time.

The Transaction Intensive Processing Option not only "imports" data but also has a function to export the transaction data TPiCS has processed to the "intermediate table for export" at a specified interval. The setting of the export can be set on a table-by-table basis.

A stable, pseudo real-time integration with other systems will be possible by using the both of the above "import function" and this "export function."



Linkage Mechanism between TPiCS-X and SAP Business One
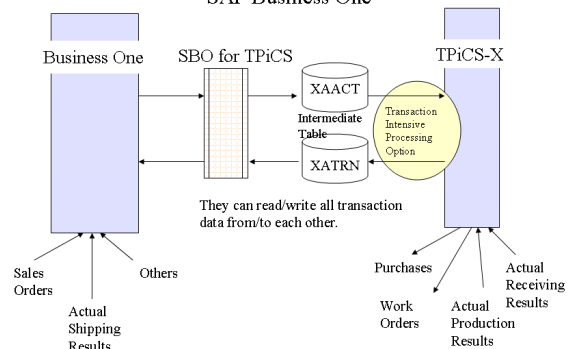
**Use 3:** You can perform operation verification of version upgrades.

Continuing with the system operation in an old version and only performing a minimum operation in a new version, you can achieve the equivalent processing of the system for the new version.

Performing a cetain period of test and evaluating the result of it, you can move into the new version.

# Small Business Pack

## 1. Purpose

This is the system for users who may say, "TPiCS-X is too hard," and "We'd like a less expensive system because we don't need all those functions." We picked up some functions from TPiCS-X and put them into a package in order to use the system easily and at a low price.

## 2. Packaged Functions

・Customer Order and Sales Management Function:
  Shipping Instruction List, Delivery Slip, Invoice, Cash Receipt Management.
・Part Explosion Function by simplified arrangements and Form Print Function:
  Purchase Order Balances, Inventory Allocation, Lot Sizing.
・Manufacturing Number Control Function.
・Actual Results Entry Function.
・Inventory Management Function.
・Progress Management Function.
・Cost Control Function.
・Multi-Currency Management.
・Three Operating Licenses (can be added separately.)
・Terminal Program of the Strategic Due Date Adjustment Option.
・Others.

## 3. Management Architecture

（1）You can enter the customer order data, calculate the production quantities for products with the simplified arrangement function, calculate the quantities to arrange for parts from the schedule for products, and issue the purchase order and work order forms.

（2）You are going to create the manufacturing number data from the customer orders and to perform the manufacturing number explosion.
  You should do the setting of manufacturing number control for the units and parts that have low commonality and perform the manufacturing number explosion. On the contrary, you should do the setting of accumulated arrangements for the parts that has commonality and perform the calculation for the common parts only by clicking the [Parts Explosion] button of the simplified arrangements.

（3）While you use the existing system for the customer order management, you can use only the functions of the manufacturing numbers and the simplified arrangements.

## 4. Other Functions

You have to use TPiCS-X's original function after calculating the quantity to arrange and creating the Order data.

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< Options to be added to the Small Business Pack >
Due Data Adjustment Option, Manufacturing Traceability Option, Shop Floor Control Option, CAD Data Conversion Option, One-item Production Option, Transaction Intensive Processing Option, Quality Control Option, Internal Control Option

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# Production Control Dashboard

It displays graphic representation of administrative data and analysis data from TPiCS-X's database.
If you are going to use the program as-is uploaded on the home page, you can use it free of charge as long as you are a TPiCS-X user. If you open the source code of the program to customize it on your own, it's going to be subject to fees (210,000 yen.)
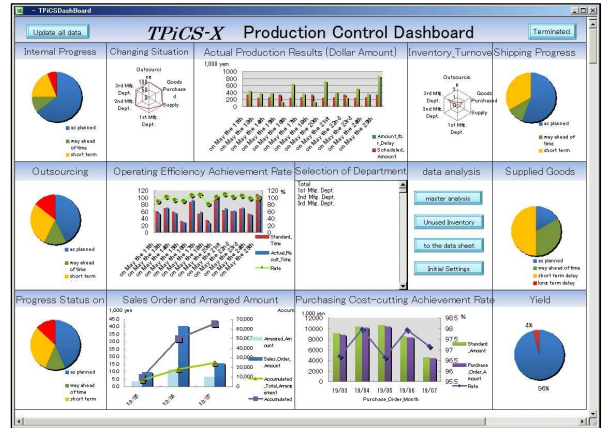


# Integrated Systems (Directly contact respective companies for any inquiries.)

## 1. ERP and Financial Accounting Systems

①**Lotus Business Consulting, Inc.**
  **SBO for TPiCS is a template to integrate TPiCS with SAP Business One.**

The SAP Business One from SAP AG is an integrated ERP package for small-and-medium-sized enterprises, providing many functions such as Financial/Management Accounting, Sales/Purchase/Inventory Management, Customer Management, and Sales/Marketing Support to support the growth of enterprises. It can be the system infrastructure for compliance (regulation compliance) that currently attracts everybody's attention and enhancement of internal control. It is the template to integrate TPiCS with that SAP Business One in pseudo real time.

  Contact: Anma-san and Higashimori-san
  TEL: 03-5649-0105, E-mail: lotusbc@lotusbc.co.jp

②**PCA Corporation      PCA Dream21**
PCA Dream21 is an integrated application package integrating the database that will become the common base throughout the company. It intends to streamline the management level as the whole company. Not only the combination of application modules such as General Ledger but also integration with the existing systems make it possible to promptly and accurately keep track of the daily fluid information of sales and finance in real time. The use of the Journal Integration module will automatically generate the journal data of Dream21 based on the actual results data of TPiCS. Also, you can automatically import the master tables for customers and items.
  Contact: PCA Corporation, E-mail: dream21@pca.co.jp

③**TPiCS-X-compliant "import format of the journal data" for the accounting system of each company:**
  **Epson Sales Japan Corporation** . . . . . . . . **Finance Boost Ai**
  **PCA Corporation**. . . . . . . . . . . . . . . . . . **PCA Accounting**
  **OBIC Co., Ltd.**. . . . . . . . . . . . . . . . . . . **Account Magistrate**
  **Sorimachi Co., Ltd.** . . . . . . . . . . . . . . . **Accounting King**
  **OHKEN Corporation** . . . . . . . . . . . . **Minister of Finance**

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**④恩梯梯数据網藍软件服務有限公司 (Eastnet)**

**Interface to the accounting systems of China .... 200,000 yen**

It will transfer the accounts payable and receivable data and such in TPiCS-X to the accounting systems. Also, it will transfer the general ledger of the accounting systems used in factories in China to the accounting systems used in headquarters in Japan, converting the accounts of the general ledger. Then, the accounting systems of headquarters in Japan will be able to create the financial statements for factories in China. (A separate estimate will be provided depending on the accounting system used in the headquarters in Japan.)

Contact: Ms. Koh Sei Jitsu
TEL: 86-755-26982126, E-mail: hss@east-net.cn

## 2. Sales Management Systems

**①Hitachi Solutions, Ltd.　　Aptage**

Contact: Takegami-san, Industrial System of the 2nd Sales Dept.
TEL: 06-6647-9490, E-mail: hideki.takegami.ue@hitachi-solutions.com

**②Densan, Inc.　　Altus II**

Altus II Sales Management System uses Microsoft Visual Studio .NET as the development tool, and achieves the smart client that maintains a good balance of flexible operability and excellent handleability based on the latest technology.

It has plenty of fuctions to support efficiency and improvements of management accuracy for a series of operations like customer crder/shipping/invoicing/cash receipt management, inventory management, purchase/receiving/accounts payable/payment management.

The integration of the customer crder/shipping/product inventory data, the purchase/receiving/accounts payable detail data and various master data (customers, suppliers, items) is possible, using the TPiCS Integration Option of Altus. Altus II makes a flexible integration to meet your system operation possible.

Contact: Ichikawa-san and Kitazawa-san, Business Sales Dept.
TEL: 026-224-6666, E-mail: sales@business.ndensan.co.jp

**③Totec Amenity Ltd.　　PI-navi**

PI-navi Sales Management System is the specialized system for manufacturing businesses that has achieved a complete integration with TPiCS. It is presented as an easy-order type of template, and it sensitively handles your demands.

Since it has the complete integration with the master data of TPiCS, it achieves the integration with production information such as inventory and shipping information in real time.

【Overview of Functions】

(1) In addition to the sales management functions of quotation/customer order/shipping/invoicing/cash receipts, the BI function to analyze the sales information from various angles is a standard feature.

(2) In addition to the conversion function from quotaion information to customer order information, different EDI information from a variety of customers is imported as customer order information.

It directly reflects inventory and allocation information of TPiCS in itself, and allows you to figure out the available inventory in real time at the time of quotation creation and customer order entry.

Importing the structure information from TPiCS to create quotations, you can perform profit simulation with it while confirming the manufacturing costs.

It implements the functions of workflow and access log collection, and it is J-SOX-compliant.

Contact: Mizuno-san, Industrial Sales Dept., Industrial System Division
TEL:052-533-6905, E-mail: sangyo@ccgw.totec.co.jp

## 3. Schedulers

**①Asprova Corporation　　Asprova for TPiCS**

(1) It provides a complete integration interface to be able to create the Gantt charts for Asprova in order for the existing users of TPiCS to use them as-is only with the setting of TPiCS.

(2) A functionally limited vesion is provided at the inexpensive price of 1,600,000 yen. It aims at the TPiCS users so that they can easily implement it with some advance settings in Asprova that match the functions of TPiCS.

(3) If you'd like to need more functions after using Asprova for TPiCS, you can freely increase functions and eventually extend them to the formal vesion of Asprova.

Contact: Asprova Inc.
TEL: 03-5498-7071, E-mail: info@asprova.com

**②Toyo Engineering Corporation　　Scheduling Kohmei**

This is a planning system for the production schedule that has been implemented in a number of customers. A wide variety of constraint conditions can be managed depending on the setting of parameters. Also, the "making-it-observable" functions like the viewers are fulfilling, and Kohmei handles broad-ranging production models of plants from manufacturing and assembly to chemical. You can achieve the production schedule planning function by using the TPiCS I/F function, considering constraint conditions and production capacity.

Contact: Irimajiri-san, Product Business Group
TEL: 047-454-1794, E-mail: komei@is.toyo-eng.co.jp

**③JT Engineering Inc.　　Joy Scheduler**

This is the production schedule software that excels in cost performance.

While it shows a low price of 1,800,000 yen (excluding taxes,) it includes high functionality as standard, including "Optimal Planning" and "DBR Function," and responds to a variety of customers' needs. High speed scheduling makes "accuracy improvement of delivery date reply," "reduction of lead time," and "precise resource allotment" possible. The standard linkage with TPiCS-X, including even master tables, makes the production control possible based on more detailed production schedule.

Contact: Takeda-san, SI Sales Dept., SI Division
TEL: 03-5441-2206, E-mail: si_jigyobu@jte.co.jp

**④AIFRONT Co., Ltd.　　Furiwake-kun**

"Furiwake-kun for TPiCS" is the adjusting tool for production schedule that enables you to easily change the production schedule data and display it in the Gantt chart with limited functions as compared with the existing schedulers. Furthermore, it enables you to automatically get the Order Balance data of TPiCS and to freely divide the schedule. And you can easily allocate a divided schedule to another line with the drag-and-drop. (You can create the work order form on your own for the operation you changed.)

Contact: Yokoyama-san, 1st Sales Dept., Nishi-Nippon Division
TEL: 06-6267-2970, E-mail: w-eigyou@aifront.co.jp

## 4. Actual Production Results Automated Collection Systems

**①Art System Corporation　　Wireless Handy Actual Results Collection System**

Thanks to the integration with the wireless portable terminals (BT-910) made by Keyence and the "Transaction Intensive Processing Option," you can enter various actual results

(receiving, completion, shipping, etc.) on the spot without wondering what location they were for afterwards such as receiving site, line, warehouse, and so on, and reflect them in TPiCS in real time. A variety of customization to this software will be available, too.

    Contact: Kato-san, SI Business Promoting Group
    TEL:022-225-3564   E-mail:katou@art-sys.co.jp

**②Nippon NCR Business Solution Co., Ltd.    TPACT**

This is to use and extend the function of the "Transaction Intensive Processing Option" in TPiCS. When you use the devices such as portable terminals and mark sensing card readers for the actual results collection (for example, receiving operation in the warehouse,) TPACT eliminates a decrease in efficiency by your moving to a TPiCS terminal each time. Using the wireless portable terminal BT-910 made by Keyence Corporation, you can perform the actual results entries for product completion (including defect,) before inspection, inspection completion, inventory transfer, etc. A variety of customization to this software will be available, too.

    Contact: Okuyama-san, Industry Solution Division
    TEL: 03-5719-8791, E-mail: webmaster@ncr-bs.com

**③Nippon System Development Co., Ltd.**
**Actual Results Entry System for portable terminals**

We are a device-maker to manufacture and sell portable terminals and barcode readers.

We've been using TPiCS officially for our production control since 2003.

We have developed the actual results entry system for portable terminals based on our experience as the TPiCS-X user, and recently decided to sell it to the outside.

Since the system is shipped out with standard functions being packaged and pre-installed in portable terminals, significant cost reduction has been achieved in comparison with the existing systems of which software is separately developed and installed.

    Contact: Ueda-san, System Equipment Sales Dept.
    TEL: 06-4391-9881, E-mail: ueda@nsd-inc.co.jp

**④Furunoshisutemuzu Inc.**
**Actual Results Collection System for**
**wireless portable terminals**

**MORS Evolution**

We are a maker that has been providing the hardware and middleware in order for your company to be able to safely and securely use the wireless LAN systems such as wireless portable terminals, access points, and wireless communication management middleware (MORS Evolution) since we developed Japan's first wireless controller in 1987. We provide our customers with the above at more than 3,000 sites already on the domestic scene, and are also expanding our sales overseas.

The integration between our "finpad" series of wireless portable terminals and the "Transaction Intensive Processing Option" makes the information of operation on the factory floor be stored in real time and directly on the TPiCS server. This contributes to optimization of inventory, reduction of lead-time in production, visualization of production schedule and progress, flexible response to schedule changes, and the "making-it-observable."

    Contact: Yasuda-san, System Dept.
    TEL: 078-304-5385, E-mail: yasuda@furunosystems.co.jp

**⑤Digital Electronics Corporation    Pro-POP System**

Pro-POP System can directly display the schedule calculated by f-MRP, one of the features of TPiCS, on the terminal (touch-screen POP terminal) of the factory floor as the operation instructions. Also, it can collect the actual production results from the equipment of the factory floor automatically and in real time, and achieve the integration with TPiCS with the use of the Continuous And Intensive Import Option.

**Pro-POP** 生産時点情報管理 システム

Furthermore, using the Shop Floor Control Option, you can start your operation with the understanding of more detailed situation.
This leads to the realization of the total production control system directly connected to the factory floor such as instructions to the planning, the production progress management, the actual results collection, and so on.

    Contact: Yahiro-san, ESS Dept.
    TEL: 03-5821-1108, E-mail: ess@proface.co.jp

### 5. Workflow

**Hitachi Solutions Nishinihon, Ltd.**
**Hi-PerBT    Web Application Solution intgrated with TPiCS**

This is a solution for the integration between Hi-PerBT, a simplified e-mail for Web application developed by Hitachi Chugoku Solutions, and TPiCS-X.

You can computerize the forms such as request for managerial decision and request for final approval, and automatically circulate them, making application and giving approval for them on the Web. We prepared the electronic forms based on TPiCS as one of TPiCS integration features. You can get internal approval for the schedule of TPiCS before having it finalized, and import purchase requests from the factory floor to TPiCS.

Of course, delivering the schedule information of TPiCS to each person in charge is possible as well. Please consider the utilization of this software for operational improvements such as improvement in efficiency and speed-up of internal form-handling work.

    Contact: Hayashi-san, Industrial Solution Business Dept.
    TEL: 082-511-8011, E-mail: kenji.hayashi.zy@hitachi-solutions.com

### 6. Web Procurement System

**Energia Communications, Inc.**
**Purchase Solution@Web™ for TPiCS**

We'd like to reduce omissions of purchase orders and mistakes of purchase order quantities! We'd like to reduce costs in the material department to a large extent!

Purchase Solution@Web contributes a great deal to all kinds of problem resolution of such procurement service. Purchase Solution@Web can process the purchase order forms generated by TPiCS from purchase orders to suppliers to receiving and inspection, using the Internet in a paperless environment. Moreover, Purchase Solution@Web can import the actual results data for which the inspection is completed to TPiCS-X, while it is equipped with approval workflow to betters and enhancement of internal control can also be achieved.

    Contact: Matsuda-san and Masuda-san
    TEL: 082-523-0307, E-mail: kaiketsu@enecom.co.jp

### 7. Customs Clearing and Distribution System

S-CUSTOM, customs clearing management system, is the system to manage the custom-house business such as registration declaration of data of members going to China according to the customs clearing request of China and customs clearing declaration, domestic transferred locations in China, customs clearing book, and customs clearing distribution. Being linked to TPiCS, it enables you to analyze the difference between the practical business data of customs clearing and the in-house practical business data. Also, it provides you with dependence on intuitive judgment, and enables you to create various records and reports obligated by customs clearing. Interlocking this software with the customs clearing system of China, you will be able to achieve electronic customs clearing, too. (Customization required.)

    Contact: Koh Sei Jitsu-san, 恩梯梯数据網藍軟件服務有限公司
        (Eastnet), E-mail: hss@east-net.cn
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# f-MRP

(Alternative title: What does the "rapid-cycle production" mean?)
Excerpted from TPiCS Report NO. 60, 03/30/01.

**Part 1**

I'm glad to hear, "Since the first factory is doing well with it, I'd like to use it for the second one next," and "We made you worry about this and that, but the first factory has made it working well. Please come see it once." Those people have been growing bigger these days.

But again, I got to hear, "We had had to pour hundreds of millions of yen into an ERP package but it failed. And one more time, we had spent hundreds of millions of yen in the implementation of another ERP package, but it failed, too. As a result of numerous discussions, we seemed to come to a conclusion that we were going to use TPiCS. But I have trouble trying to write the request for managerial decision that will ask for the system of one million yen to use TPiCS."

I wish I could say, "It's alright and don't worry about it. There are many stories like that."

But I guess he is in a difficult position in reality.

Though they had poured hundreds of millions of yen into the implementation of an ERP package, it didn't work out well. They found themselves coming to a coclusion that the one-million-yen package of TPiCS might work for them.

If a person who had made the decision on the previous system implementations is the same person as the one who made the final decision to go with TPiCS this time, I think he must be a wonderful person.

I think that he has the ability to perceive the truth while he has the courage to accept the past failure.

It is quite natural that one might think pouring hundreds of millions of yen would make the system as one expected.

If such a big budget drove the system implementation, there must have been many perosons involved in the discussions, not just one, and that's the result of it.

Because commom knowledge of Japan as we know it today is like that, it is no wonder that they came to such a conclusion.

I didn't ask them how many years ago they made plans for the system, but if it was ten years ago, for example, there still remained some afterglow of bubble boom at that time and it must have been the time when they didn't make as many strenuous demands on the manufacturing business as they do these days. If that's the case, I don't think the conclusion they made at that time was all the more reprovable.

I don't know what problems the previous system had and what the good points are about TPiCS in the case of this user, but I'd like to ask the user about them if I have a chance.

**Part 2**

Here's a phone call from a computer sales agent.

"I have a customer who has been studying systems like comparing multiple candidates, but I'd like to recommend TPiCS to them if you don't mind. Getting some materials of TPiCS and visiting homepages, I think I got a grip on it pretty much. But I've found 'the concept of a buffer' and 'the system that can perform the MRP calculations from today' written in the No. 53 report. What do they mean?"

This story indicates the person seems to know pretty much about the production control.

Believing from my long experience (?) that he will never understand if I start explaining right away, I ask him back instead, "How would you like me to explain it?"

"I think any system can 'perform the MRP calculations from today,' can't it? For example, R3 from SAP AG perform them with the concept of 'time fence'…"

I say to myself, "Here he comes."

"You said 'time fence' just now, but what is it?"

"In order to calculate for today we've gotta do the physical inventory (? by Ninomiya) every day, but everybody on the factory floor is gonna get into a mess if we do exactly. So, we can't do the processing in reality and that's why they have the function of 'time fence'…"

"That means you're 'not gonna include today in the calculations,' are you?"

"Nope. Because it's gonna be useless if we calculate it…"

"But if you can do it, that soulds good, doesn't it? You don't have to do the physical inventory every day, or everybody on the factory floor is not gonna get into a mess if you do exactly. And if you can promptly handle the orders from your customers, that sounds even better, doesn't it?

**f-MRP** of TPiCS can really do it."



Period from parts explosion to order receipts by suppliers
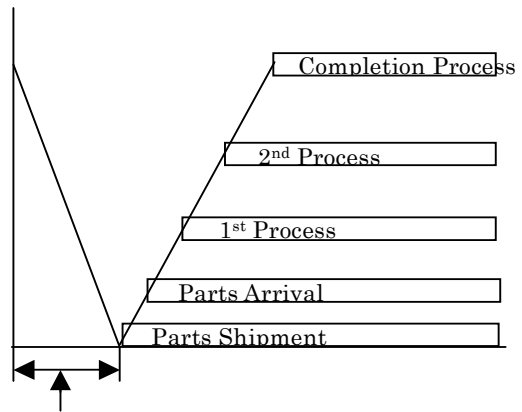
For "humans who make things," however, it is true that the telephone builds "the wall in between to think awhile."

The drawing below is what I drew when I was still working at an automobile maker almost 20 years ago (1982 or 1983.)

I was working on the project of **"how to shorten the production cycle"** to shorten the periods from receiving customer orders to delivering them.

I wasn't involved in the project on the system side but was involved on the production side. I think it took us about a week at that time from making the production schedule with a mainframe computer, performing the

parts explosion, making the purchase order data, issuing the purchase order forms, to having them delivered at parts manufacturers.

In addition, I think it took us, if I'm correct, another week from getting those parts after the shipments by parts manufacturers, welding and painting the auto body, mounting the engine, to the finish.

So, it wasn't possible that we would cut down the period from receiving customer orders to shipping them out to shorter than two weeks no matter how hard we worked. Back then, we were making the production schedule by dividing each month into three parts: early, middle, and end. When production between two parts was allocated to the latter part and the period for allocation of cars was taken into consideration, eventually it took us almost a whole month in reality.

This is the "wall (limit)" of the system for part procurement and production instructions for auto manufacturers against the background of tremendous purchasing power.

Manufacturers who have tremendous purchasing power present their "forecast" to parts manufacturers, have them prepare their parts, and are able to give them their final schedules as "delivery orders." But average manufacturers cannot do those things. After they send their purchase orders, they are going to receive ordered parts when the purchase lead-time has passed.

In other words, the receipt is going to be as late as the purchase lead-time.

It was the technique of "schedule changeover" I came up with at that time in the hope of being able to get cars delivered quicker.

It is a way to change individual schedule data that have been released as plans.

It was in the middle of the implementation of "body color changeover" and in preparation for "option changeover" next when I resigned from the company.

The "option changeover" was a mechanism to be able to change just simple parts on the body side, being intended for the changeover that would impact the engine and the transmission to be the next step.

This mechanism represents the concept of "changing order details in the already-purchased period as the word of "changeover" indicates.

This solution, however, only applies to manufacturers with massive purchasing power and this mechanism doesn't work out for average manufacturers.

I believe manufacturers must have "mutual cooperation."

Whenever they force their suppliers to accept irrational demand, it will come around to them. It could lead to delays in delivery, cost increases, and eventually quality deterioration.

Don't get me wrong. I'm not saying, "So, it's OK to make no progress."

We all must try to make advance in the sprit of "mutual cooperation," but our response capabilities vary depending on the company or plant.

The question is how we are going to get along with lots of parts and lots of suppliers whose situation and response capability vary.

To make the production control system, I've always had this question in mind after I resigned from the auto company.

Having said that, it's not to say that **f-MRP** of today was possible in early versions of TPiCS.

It was a very simple MRP system in the beginning, only calculating the time bucket step-by-step.

However, some "courageous people" got to use some of

the first-generation TPiCS.

And one time, somebody says, "Mr. Ninomiya, our products change a lot like 'sell well' and 'not sell well.' I might say they have seasonality or they are sensitive to changes in climate. For example, we see sharp spike in sales when it gets 'hot,' and all of a sudden they don't sell well when 'autumn breeze starts blowing.' When we released a new product, sometimes it was a big hit more than expected and sometimes it wasn't. As for parts, some take three to four months, but we have many parts that take just three days to get the delivery after placing an order.

I'm wondring how we can manage these kinds of things well."

Taking it from my experience of the times at the auto company that we, the manufacturing industry, all must have the same problems more or less, and that these problems will have to be more important, I began to think desperately about it.

"I can't do (or don't want) any changes for what has been purchased, but the quantities to be used may change… But if the quantities used are gonna increase a lot, there will be no way to produce… How can I figure it out? The change in the quantities used will impact our inventory…

I've got it! All I need is to use the settings of the 'minimum inventory' and the 'maximum inventory' by part. "

November in 1987, that was the starting point of TPiCS **f-MRP**.
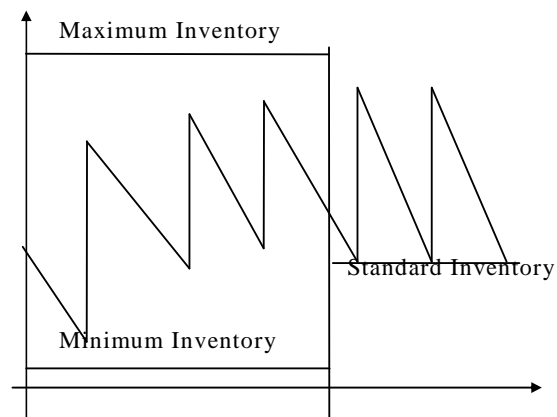


There's a way to say that "the production control is something to control abnormalities."

Essentially, I think that "the production control is something to control the occurrence prevention of abnormalities." But it is true that "you must control the abnormality that has already occurred."

In discussions with many people on the production control, I found them pretty much interested in the function to process the abnormal state that has already occurred, but they didn't seem to go over the abnormality in planning very eagerly.

In other words, they seemed to be really generous about processing the abnormal state in planning such as the following situations: "What if unplanned orders come in today?" "What if the production for today has been cancelled and what if the order scheduled to be made for tomorrow has been changed to a different product?" "What if the engineering change has happened to a product that is scheduled to be made for day after tomorrow?" "What if the schedule we already have their forecast for has changed at the last minute?" They all seemed to be convinced by just the words of "That's gonna be an exceptional processing…"

Since TPiCS treats those things as the name of the

game, they are not an abnormal processing or an exceptional processing.

For example, I sometimes get a question of "Can you tell me how I will process it when I got a forecast changed?" Since TPiCS processes it in too natural a flow and the manual only gives you simple description about it, I guess he didn't notice it.

In addition to that, since the concept of "change after order release" is insignificant — we don't have to make it significant — in TPiCS, you can operate the forecast change on the normal processing screen.

In the systems made with a previously described "changeover-like" idea, however, it must be an exceptional function. So, they might have a dedicated screen called "change after order release" that might include luxurious functions.

I'm kind of worried a little about the situation where there may be some people thinking, "Who doesn't know we have changes after order release? The operability is important on that occasion. The luxurious change functions sound easier to use."

**Part 3**

I had a visitor with his customer saying, "When I showed him a catalogue of TPiCS, he says, 'This is exactly what I asked you to look for.'"

The end user is a manufacturer of auto parts.

Since I was from one of the auto manufacturers, I'm able to give them a demo right away when I have only a few conversations with a customer from the auto industry.

Every time I give them an explanation, they speak in low voices to each other and nod at each other.

"Huh, TPiCS can do this."

"That was bothering me!"

I guess he has execeptionally had a rough time in the past.

As I make it through all the explanation, he says, "It's just how I'd pictured it after having gone through the material."

The customer turns to the sales agent he came with and says, "My fellow traders all have a hard time with this problem. If you introduce TPiCS to them, they will be happy with it. I've seen a lot of systems from other companies, and 'What kind of system do you use?' is a hot topic in my club. No other systems are making so much difference as the present system of my company, and everybody's having a hard time with this problem."

f-MRP may be hard to explain in theory, but easy to understand for those who are actually making things, especially for those who are producing in rapid cycle, or for those who have had an extremely hard time with "how to achieve it."

# Production Model  The respective series of **TPiCS** can apply to the following products:

## Example-1 (mold, machine, assembly)

```
                    Product
                   Assembly
        ┌─────────────┼──────────────┐
       U1            U2             U3
   UnitAssembly   ┌───┼───┐        ┌──┴──┐
              Plating  Part  Part
              Polishing
              Machining
              Grinder
              Casting
           ┌──────┴──────┐
        Material   Hydraulic Core
```
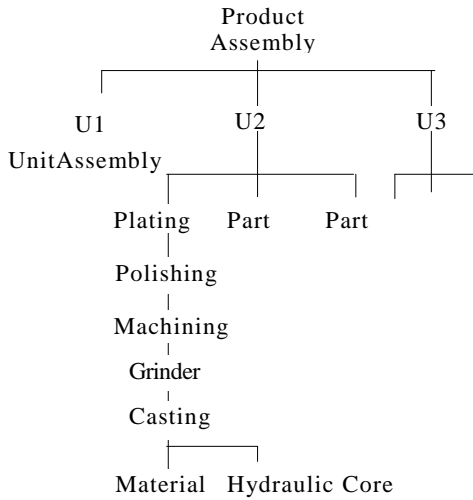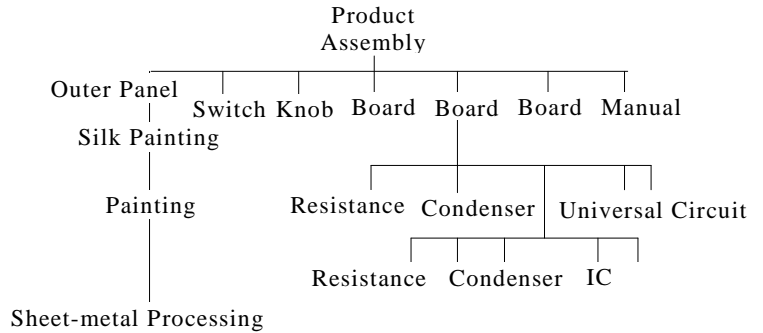
Adjusting the workload in bottleneck processes,
You can explode the BOM.

## Example-2 (food goods, drugs)

```
     250g Packs      500g Packs      1kg Packs
   ┌───┼───┐      ┌───┼───┐      ┌───┼───┐
  H1  H2  H3     H4  H5  H6     H7  H8  H9
Packing Mat'l  Label │ Bottle    │ Can
                     Inspection
                  Finished Product
                   Heat Treatment
                      ┌───┼───┐
                     X   Y   Z
                   Agitation
              ┌───┬───┬───┬───┬───┐
             A   B   C   D   E   F
             A'  B'  C'  D'  E'  F'
```

Add-in Mat'l

Inspection

Raw Mat'l Purchase
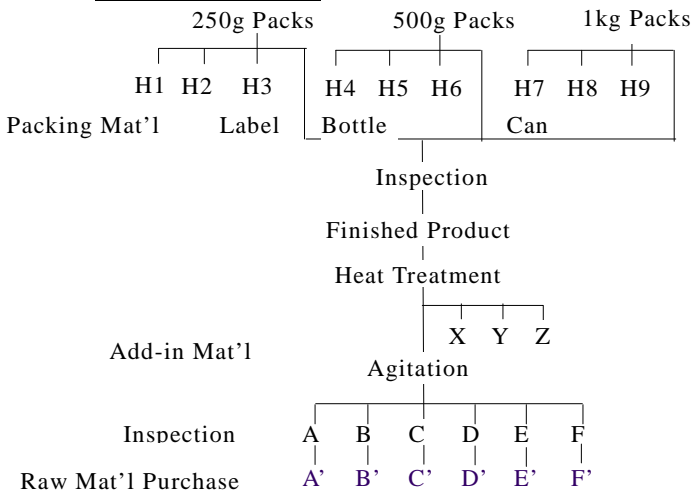
For example,
If 98kg has been completed for the schedule of 100kg,
  raw mat'l equivalent to 100kg must have been nurtured,
  only 98kg of packing mat'l was used.
The withdrawal method can be specified by item.

## Example-3 (electricity-related products)

```
                       Product
                      Assembly
Outer Panel  ┌──┬────┼────┬────┬────┐
         Switch Knob Board Board Board Manual
Silk Painting            ┌───┼────┐
                    Resistance Condenser Universal Circuit
Painting           ┌────┼────┐
              Resistance Condenser IC
Sheet-metal Processing
```

Something insubstantial like "circuits" can be registered as an item (phantom) for the "Master Management."
Such an item is omissible for the actual results entry.

## Example-4 (supplied parts)

```
                    Product
                   Assembly
        ┌──────┬──────┬──────────┐
       U1     U2     U3      Unit Outsrcing
          ┌───┼───┬────┐      ┌──────┐
       Front Rear Board Board  Parts@outsrc
       Panel Panel   │     │
   Silk Painting          Supply  outsrc
   Painting        ┌───┬───┬───┐
   Sheet-metal    Resistance Condenser IC
   Processing
   Steel Sheet
```
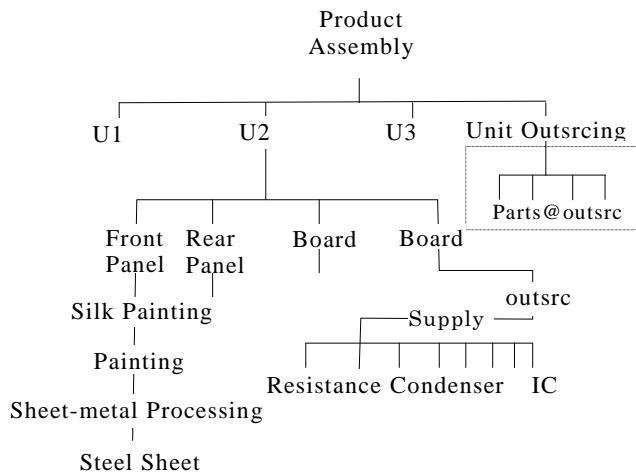
Inventory at supplied outsourcing can be managed by an item of "supply" being set up.
Something like parts purchased at outsourcing can be registered or omitted.

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# **TPiCS** Loan System

1. We will loan out a TPiCS-X-preinstalled notebook computer including manuals, or a demo version of TPiCS (a set of CD-ROM, manuals, etc.) for free of charge.
2. Please fill in all the necessary information on the separate application form (turquoise paper,) and send it with the product catalog and pamphlet of your company to us. Upon checking of your application form after its arrival, we will send ours to you.
3. The loan period will be 3 weeks.