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Control & Communication System Profile Specification (for Machine) Part 3: Recommended Description

CSP+ Ver.1.0
BAP-C2008ENG-002

Revisions

Sub number	Revision description	Issued
*	First edition	July, 2017

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1. FOREWORD

This document is "Part 3 - Recommended Description" of "Control & Communication System Profile Specification (for Machine)".

The Control & Communication System Profile for machine (hereinafter referred to as "CSP+ for machine") is a data set that visualizes machine information to simplify development by application vendors of application software that manages, monitors, and controls the machine, and settings by the machine users. The CSP+ for machine contains the following information related to the machine described.

- Information related to the machine specifications
- Machine information to be released for application software (machine information)
- Information related to data to be acquired from the machine and its acquisition method (machine data)
- Linked information between machine information and machine data

The CSP+ for machine is generally handled as CSP+ file for machine described in the XML format.

In "Part 3- Recommended Description", parts of KPI specified in ISO 22400, for example, are defined as recommended descriptions with CSP+ for machine.

The version of Control & Communication System Profile for machine specification described in this document (hereinafter referred to as CSP+ for machine specification version) is version 1.0.

2. SCOPE OF APPLICATION

This document is "Part 3 - Recommended Description" of "Control & Communication System Profile Specification (for Machine)", and specifies recommended descriptions as CSP+ for machine specifications.

3. NORMATIVE REFERENCES

[1] ISO 22400-1:2014, Automation systems and integration – Key performance indicators (KPI) for manufacturing operations management – Part 1: Overview, concepts and terminology
[2] ISO 22400-2:2014, Automation systems and integration – Key performance indicators (KPI) for manufacturing operations management – Part 2: Definitions and descriptions

4. TERMINOLOGY, DEFINITIONS, ABBREVIATIONS

4.1. Terminology

4.1.1. CSP+ for machine

Data set to describe the following information related to the machine

- Information related to the machine specifications
- Machine information to be released for application software
- Data to be acquired from the machine and its acquisition method
- Linked information between machine information and machine data

4.1.2. CSP+ file for machine

CSP+ for machine in the XML format

4.1.3. Machine

Machine controlled by machine tools or at least one controller (such as PLC and CNC)

4.1.4. Machine data

Generic term of information related to data to be acquired from the machine and its acquisition method

4.1.5. Machine information

Information created by aggregation of machine data aggregated for easy handling in application software.

4.1.6. Section

Component of the CSP+ for machine

4.1.7. Part

Component of the section

4.1.8. Element

Component of the part

4.1.9. Item

Detailed information related to the element. Example: Data type, engineering unit

4.1.10. Machine vendor

Vendors that develop the machine

4.1.11. Application vendor

Vendors that develop application software

4.1.12. Machine user

End users who use the machine and companies that provide machine installation and maintenance

4.2. Abbreviations and Symbols

CNC	Computer Numerical Control
CSP+	Control & Communication System Profile
ISO	International Organization for Standardization
KPI	Key Performance Indicator
PLC	Programmable Logic Controller
SLMP	Seamless Message Protocol
XML	Extensible Markup Language

5. RECOMMENDED DESCRIPTIONS

5.1. About Recommended Descriptions

Machine information label names specified as a recommended description in this document cannot be used for other applications. Although using the recommended descriptions specified in this part is not necessarily required, following the specifications presented in this document is recommended when the information for the same application is to be described as the CSP+ for machine.

5.2. Classification List of Machine Information for Recommended Descriptions

Table 5-1 shows the classification list of machine information whose recommended descriptions are specified in this document. For details on recommended descriptions for each classification, refer to Chapter 6 and later.

Table 5-1 Classification List of Machine Information

No.	Classification of machine information	Reference target
1	ISO22400	Chapter 6

5.3. Interpretation of Periods

Machine information may result from measurement/calculation for a certain period. Depending on the type of machine information, application software needs to use machine information acquired from multiple different periods. To define production quantity of machine information, for example, periods containing multiple meanings can be defined such as yesterday's production quantity (result) and today's production quantity (at the time of measurement).

Regarding the CSP+ for machine specifications, it is recommended to define the COMM_IF_VARIABLE part or COMM_IF_CONFIGURATION part for each measurement period and to describe elements having fixed LABEL names in the part as machine information. It is also recommended to describe them so that measurement periods can be identified with part names. For the description, combine a character string which indicates a moment and a character string which indicates a target using an underscore (_) and add to the end of a part name. Character strings which indicate moments are defined in Table 5-2, and character strings which indicate targets are defined in Table 5-3.

Table 5-2 Character String Indicating Time

No.	Character string	Meaning
1	pre	For a character string () which indicates the target, specify the immediately previous (completed) target. For example, "pre_day" indicates yesterday.
2	cur	For a character string () which indicates the target, specify the current (not completed) target. For example, "cur_day" indicates the current day.
3	(Any character string)	Any character string other than those above can also be specified.

Table 5-3 Character String Which Indicates the Target

No.	Character string	Meaning
1	year	Indicates year.
2	month	Indicates month.
3	week	Indicates week.
4	day	Indicates day.
5	hour	Indicates time.
6	order	Indicates order. Depending on the type of machines, such strings as "lot" and "work" are used, but it is recommended to use "order" if possible.
7	lot	Indicates lot.
8	work	Indicates work.
9	(Any character string)	Any character string other than those above can also be specified.

Identifying a measurement period through the suffix of a part name is recommended; however, rather than judging about detail information regarding a measurement period through a part name, acquire it from the P_MeasurementDate and P_Period elements of the BLOCK_MEMORY part.

Figure 5-1 shows how the suffix of a part name is to be assigned for each measurement period and the relationships between measurement periods and P_MeasurementDate/P_Period elements.

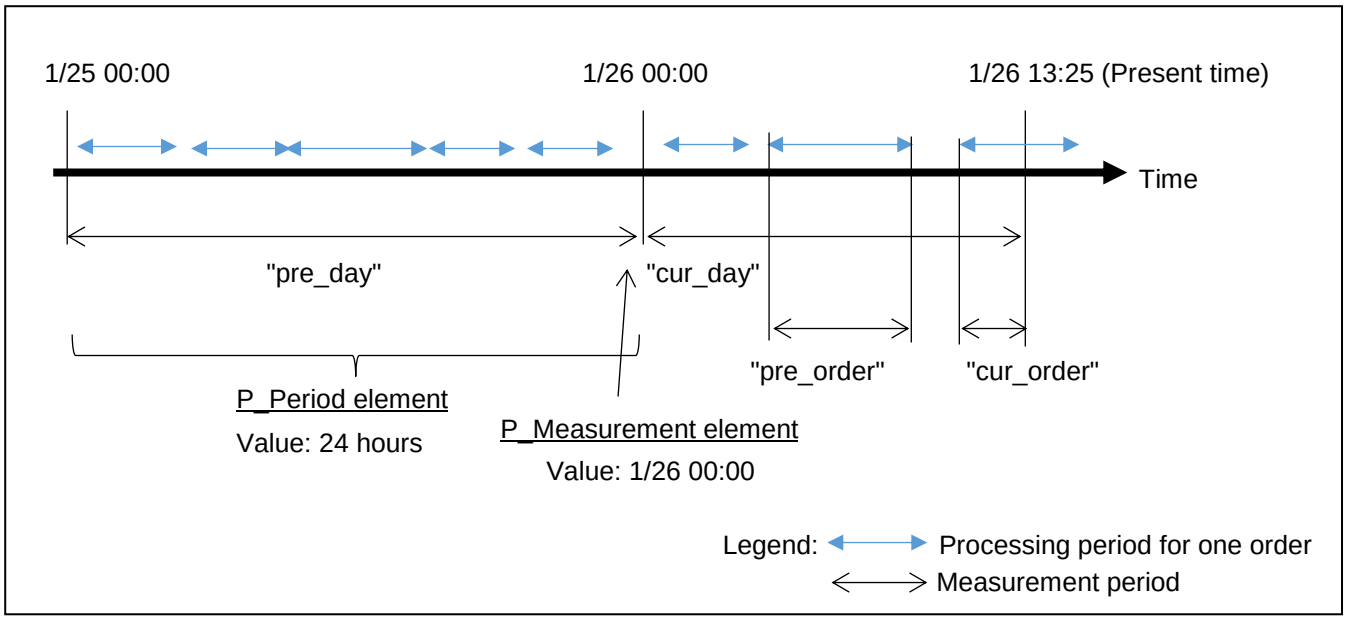

Figure 5-1 Example of a Relationship Between the Part Name Suffix Indicating the Measurement Period and the BLOCK_MEMORY Element

6. COMPLYING WITH ISO 22400

6.1. Machine Information List

Among all 34 KPIs defined in ISO 22400, 10 KPIs and the elements to be used for calculation of the KPIs are specified as "machine information". The KPIs (among the 34 KPIs) defined as "machine information" in this specification document are shown in Table 6-1. Table 6-2 lists elements to be used for calculation of the KPIs.

Table 6-1 Machine Information (for Each KPI) Complying with ISO 22400

KPI No.	Category	KPI name (Japanese)	KPI name (English)
2	Production operation management	Allocation ratio	Allocation ratio
5		Utilisation efficiency	Utilisation efficiency
11		Set up ratio	Set up ratio
12		Technical efficiency	Technical efficiency
13		Production process ratio	Production process ratio
23		Comprehensive energy consumption	Comprehensive energy consumption
30		Equipment load ratio	Equipment load ratio
31	Maintenance operation management	Mean operating time between failures	Mean operating time between failures
32		Mean time to failure	Mean time to failure
33		Mean time to repair	Mean time to repair

Table 6-2 Machine Information (for Each Element for KPI Calculation) Complying with ISO 22400

No.	Category	Element name (Japanese)	Element name (English)	Corresponding KPI No.
1	Production operation management	actual unit busy time	actual unit busy time	2, 5
2		actual order execution time	actual order execution time	2, 13
3		actual production time	actual production time	5, 12, 13
4		actual unit setup time	actual unit setup time	11
5		actual unit processing time	actual unit processing time	11
6		actual unit delay time	actual unit delay time	12
7		Energy consumption	comprehensive energy consumption	23
8		produced quantity	produced quantity	23, 30
9		equipment production capacity	equipment production capacity	30
10	Maintenance operation management	operating time between failures	operating time between failures	31
11		time to failure	time to failure	32
12		time to repair	time to repair	33
13		failure event	failure event	31, 32, 33

6.2. Machine Information Regarding Production Operation Management

Figure 6-1 and Figure 6-2 show an image of the structure when the machine information regarding production operation management is described. This image shows an example in which each element of the COMM_IF_CONFIGURATION part refers to the BLOCK_PARAM part for each element from the REF_PARAM item, and the REF_MEMORY item entirely refers to the same BLOCK_MEMORY part.

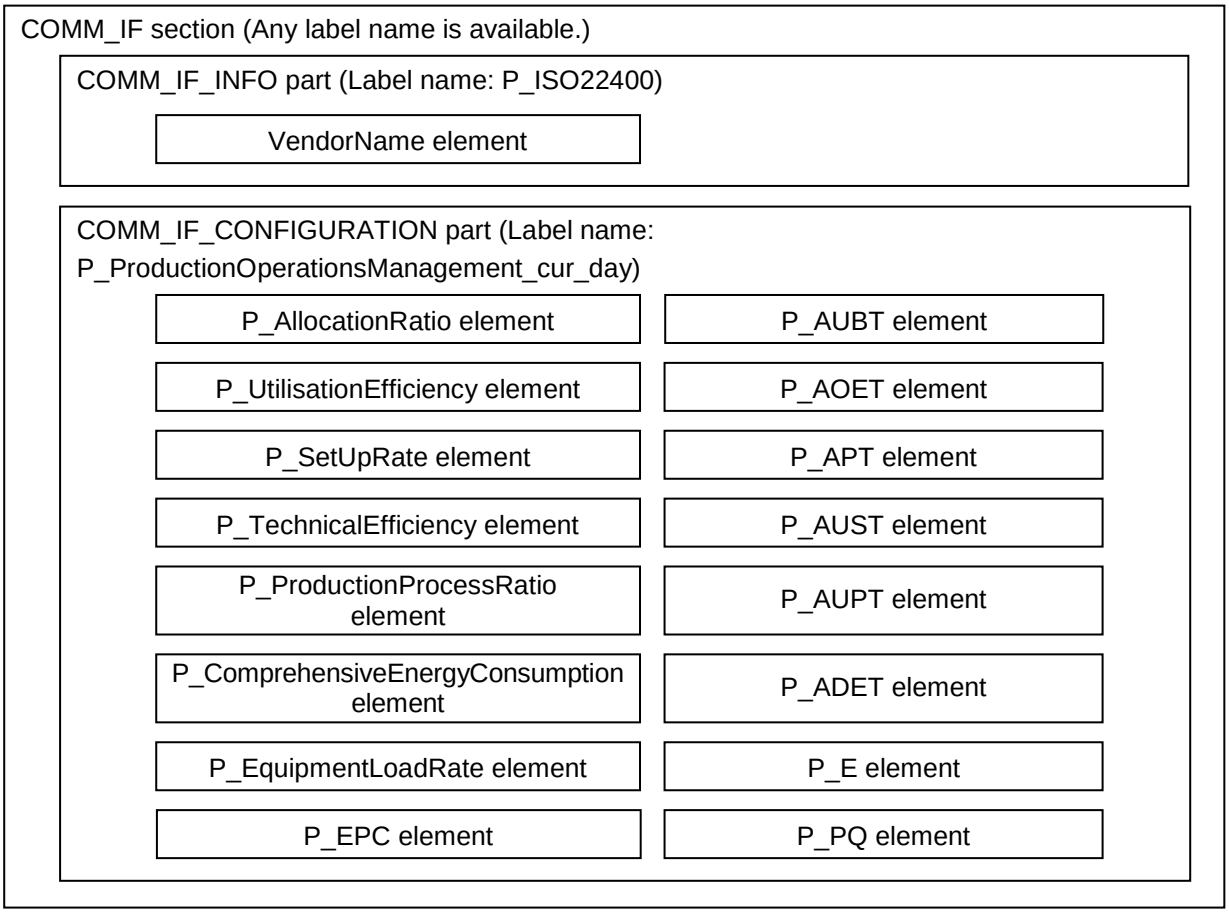

Figure 6-1 Image of the Structure When the Machine Information Regarding Production Operation Management Is Described (COMM_IF Section)

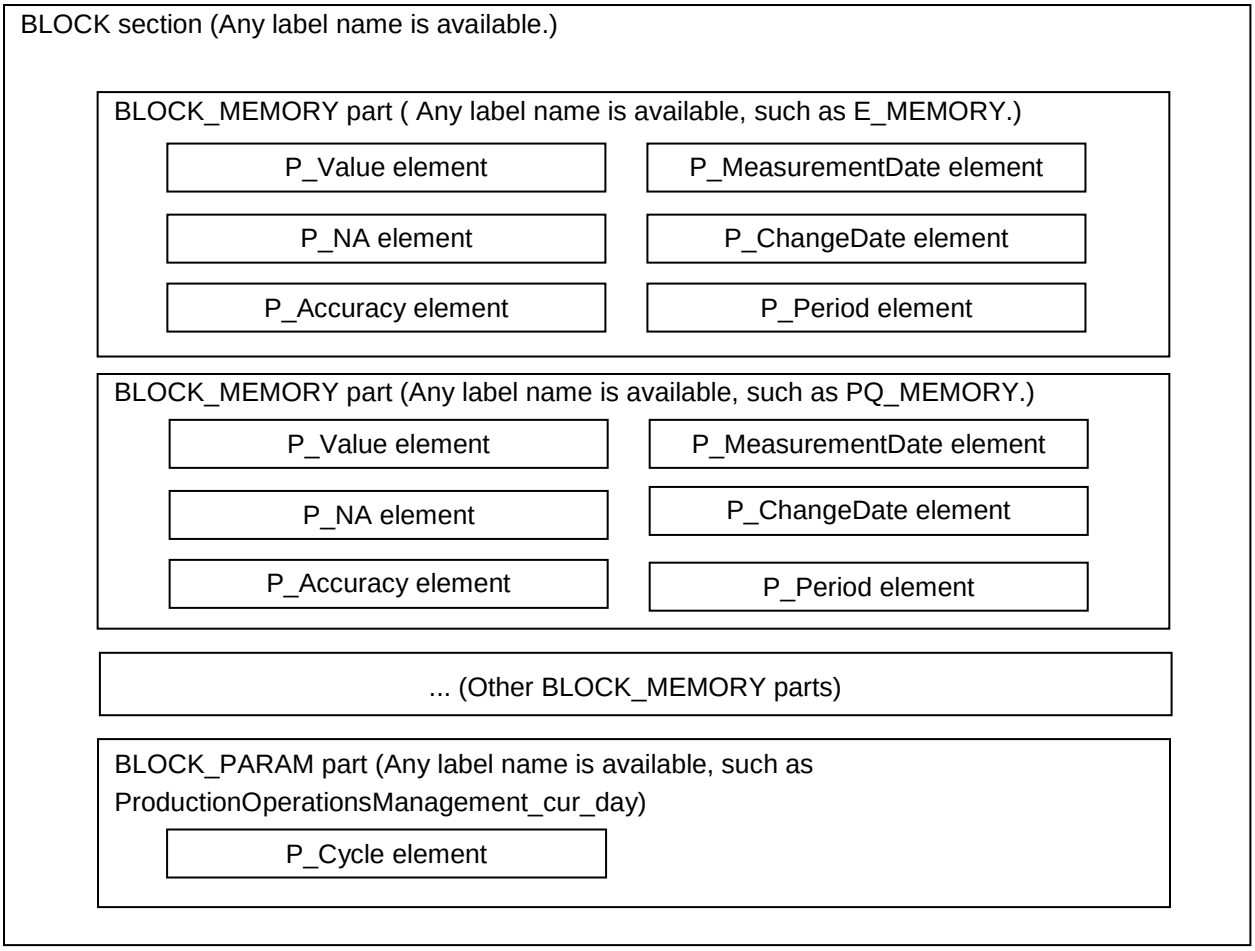

Figure 6-2 Image of the Structure When the Machine Information Regarding Production Operation Management Is Described (BLOCK Section)

Table 6-3 shows the description specification for the COMM_IF_INFO part.

Table 6-3 Description Specification for the COMM_IF_INFO Part

No.	Part name	Description details	Required/ Optional
1.	P_ISO22400	Describe the machine information to be used for KPI calculation.	Optional

Table 6-4 shows the description specification for the COMM_IF_CONFIGUTRATION part.

Table 6-4 Description Specification for the COMM_IF_CONFIGURATION part

No.	Part name	Description details	Required/ Optional
1.	"P_ProductionOperationsManagement_" plus character string which indicates moment" plus "_" plus "character string which indicates the target	Describe the machine information regarding production operation management. For the character strings which indicate moment, refer to Table 5-2, and for the character strings which indicate targets, refer to Table 5-3.	Optional

Table 6-5 shows a list of elements to be described in the COMM_IF_CONFIGURATION part. For the data types, refer to Table 6-6.

Table 6-5 List of Elements to Be Described in the COMM_IF_CONFIGURATION Part

No.	Machine information	Element name	Description details	Data type	CATEGORY	Required/ Optional
1.	Allocation ratio	P_AllocationRatio	Write the allocation ratio.	Ratio unit type	KPI	Optional
2.	Utilisation efficiency	P_Utilisation Efficiency	Write the utilisation efficiency.	Ratio unit type	KPI	Optional
3.	Set up ratio	P_SetUpRate	Write the setup ratio.	Ratio unit type	KPI	Optional
4.	Technical efficiency	P_TechnicalEfficiency	Write the technical efficiency.	Ratio unit type	KPI	Optional
5.	Production process ratio	P_ProductionProcess Ratio	Write the production process ratio.	Ratio unit type	KPI	Optional
6.	Comprehensive energy consumption	P_Comprehensive EnergyConsumption	Write the comprehensive energy consumption.	Energy unit type	KPI	Optional
7.	Equipment load ratio	P_EquipmentLoadRate	Write the equipment load ratio.	Ratio unit type	KPI	Optional
8.	Actual unit busy time	P_AUBT	Write the actual unit busy time.	Time unit type	KPI ELEMENT	Optional
9.	Actual order execution time	P_AOET	Write the actual order execution time.	Time unit type	KPI ELEMENT	Optional
10.	Actual production time	P_APT	Write the actual production time.	Time unit type	KPI ELEMENT	Optional
11.	Actual unit setup time	P_AUST	Write the actual unit setup time.	Time unit type	KPI ELEMENT	Optional
12.	Actual unit processing time	P_AUPT	Write the actual unit processing time.	Time unit type	KPI ELEMENT	Optional
13.	Actual unit delay time	P_ADET	Write the actual unit delay time.	Time unit type	KPI ELEMENT	Optional
14.	Energy consumption	P_E	Write the energy consumption.	Energy unit type	KPI ELEMENT	Optional
15.	Produced quantity	P_PQ	Write the produced quantity.	Quantity unit type	KPI ELEMENT	Optional
16.	Equipment production capacity	P_EPC	Write the equipment production capacity.	Quantity unit type	KPI ELEMENT	Optional

Table 6-6 List of Recommended Data Types

No.	Category	Data type	Remarks
1.	Time unit type	Time type	TIME
2.		Unsigned integral data type	UINT
3.		String type	STRING, STRING_U
4.	Energy unit type	Unsigned integral data type	UINT
5.		Real data type	REAL, LREAL
6.	Quantity unit type	Unsigned integral data type	UINT
7.		Real data type	REAL, LREAL
8.	Ratio unit type	Real data type	REAL, LREAL

Table 6-7 and Table 6-8 show description specifications for the BLOCK_MEMORY/BLOCK_PARAM parts.

Table 6-7 List of Elements to Be Described in the BLOCK_MEMORY/BLOCK_PARAM Parts

No.	Machine data	Description details	BLOCK_MEMORY part name corresponding to machine data (*1)	BLOCK_PARAM part name corresponding to machine data (*2)
1.	Allocation ratio	Write the allocation ratio.	Optional	Optional
2.	Utilisation efficiency	Write the utilisation efficiency.	Optional	Optional
3.	Set up ratio	Write the setup ratio.	Optional	Optional
4.	Technical efficiency	Write the technical efficiency.	Optional	Optional
5.	Production process ratio	Write the production process ratio.	Optional	Optional
6.	Comprehensive energy consumption	Write the comprehensive energy consumption.	Optional	Optional
7.	Equipment load ratio	Write the equipment load ratio.	Optional	Optional
8.	Actual unit busy time	Write the actual unit busy time.	Optional	Optional
9.	Actual order execution time	Write the actual order execution time.	Optional	Optional
10.	Actual production time	Write the actual production time.	Optional	Optional
11.	Actual unit setup time	Write the actual unit setup time.	Optional	Optional
12.	Actual unit processing time	Write the actual unit processing time.	Optional	Optional
13.	Actual unit delay time	Write the actual unit delay time.	Optional	Optional
14.	Energy consumption	Write the energy consumption.	Optional	Optional
15.	Produced quantity	Write the produced quantity.	Optional	Optional
16.	Equipment production capacity	Write the equipment production capacity.	Optional	Optional

*1: Although it is optional, it is recommended to delete "P_" from the LABEL name of machine information and use a part name having "_MEMORY" added to the end.
Example: For "P_AUBT", which is the LABEL name of the actual unit busy time, using "AUBT_MEMORY" is recommended as the BLOCK_MEMORY part name.

*2: The description is optional because the part can be shared by multiple machine information items unlike the BLOCK_MEMORY part. However, if the part is prepared as a part dedicated to specific machine information, it is recommended to delete "P_" from the LABEL name of machine information and use a part name having "_PARAM" added to the end.

Table 6-8 Option Information Regarding Machine Data (Production Operation Management)

No.	Category	Part / Option information / Machine data	BLOCK_MEMORY					BLOCK_PARAM or BLOCK_MEMORY	BLOCK_PARAM
			P_Value	P_NA	P_ChangeDate	P_MeasurementDate	P_Period	P_Accuracy	P_Cycle
1.	KPI	Allocation ratio	◎	○	○	◎	◎	-	◎
2.		Utilisation efficiency	◎	○	○	◎	◎	-	◎
3.		Set up ratio	◎	○	○	◎	◎	-	◎
4.		Technical efficiency	◎	○	○	◎	◎	-	◎
5.		Production process ratio	◎	○	○	◎	◎	-	◎
6.		Comprehensive energy consumption	◎	○	○	◎	◎	○	◎
7.		Equipment load ratio	◎	○	○	◎	◎	○	◎
8.	Element	Actual unit busy time	◎	○	○	◎	◎	-	◎
9.		Actual order execution time	◎	○	○	◎	◎	-	◎
10.		Actual production time	◎	○	○	◎	◎	-	◎
11.		Actual unit setup time	◎	○	○	◎	◎	-	◎
12.		Actual unit processing time	◎	○	○	◎	◎	-	◎
13.		Actual unit delay time	◎	○	○	◎	◎	-	◎
14.		Energy consumption	◎	○	○	◎	◎	○	◎
15.		Produced quantity	◎	○	○	◎	◎	○	◎
16.		Equipment production capacity	◎	○	○	◎	-	○	◎

◎ Required ○: Recommended -: Not needed

6.3. Machine Information Regarding Maintenance Operation Management

Figure 6-3 and Figure 6-4 show an image of the structure when the machine information regarding maintenance operation management is described. This image shows an example in which each element of the COMM_IF_CONFIGURATION part refers to the BLOCK_PARAM part for each element from the REF_PARAM item, and the REF_MEMORY item entirely refers to the same BLOCK_MEMORY part. As for the COMM_IF section, machine information regarding production operation management and maintenance operation is to be described in the same section.

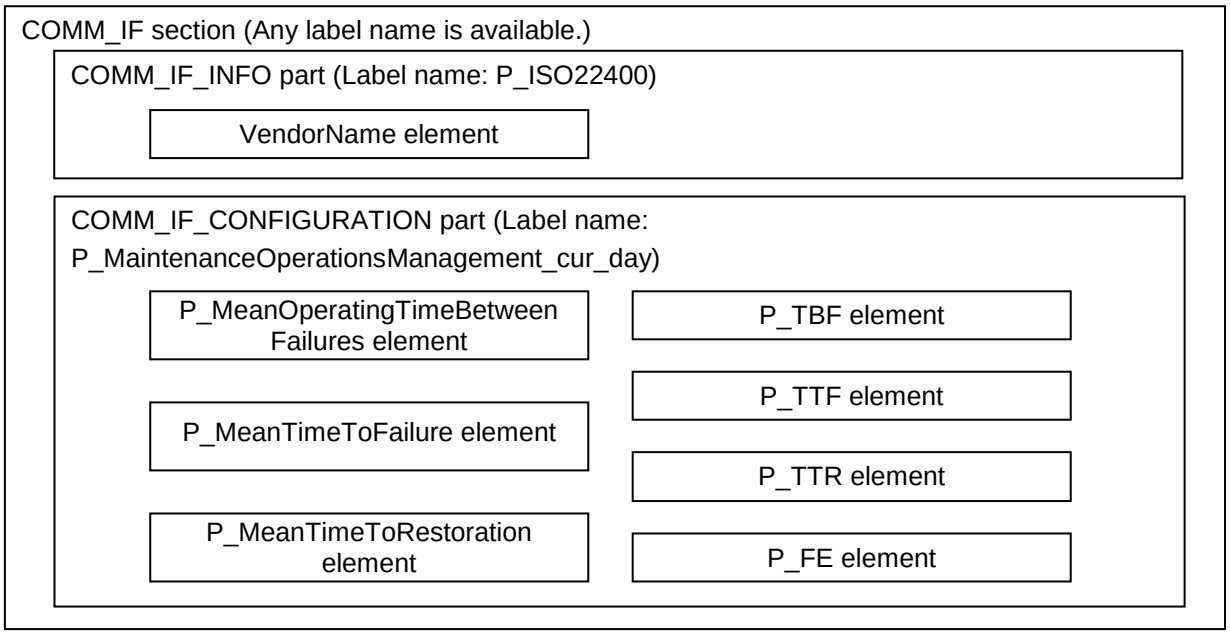

Figure 6-3 Image of the Structure When the Machine Information Regarding Maintenance Operation Management Is Described (COMM_IF Section)

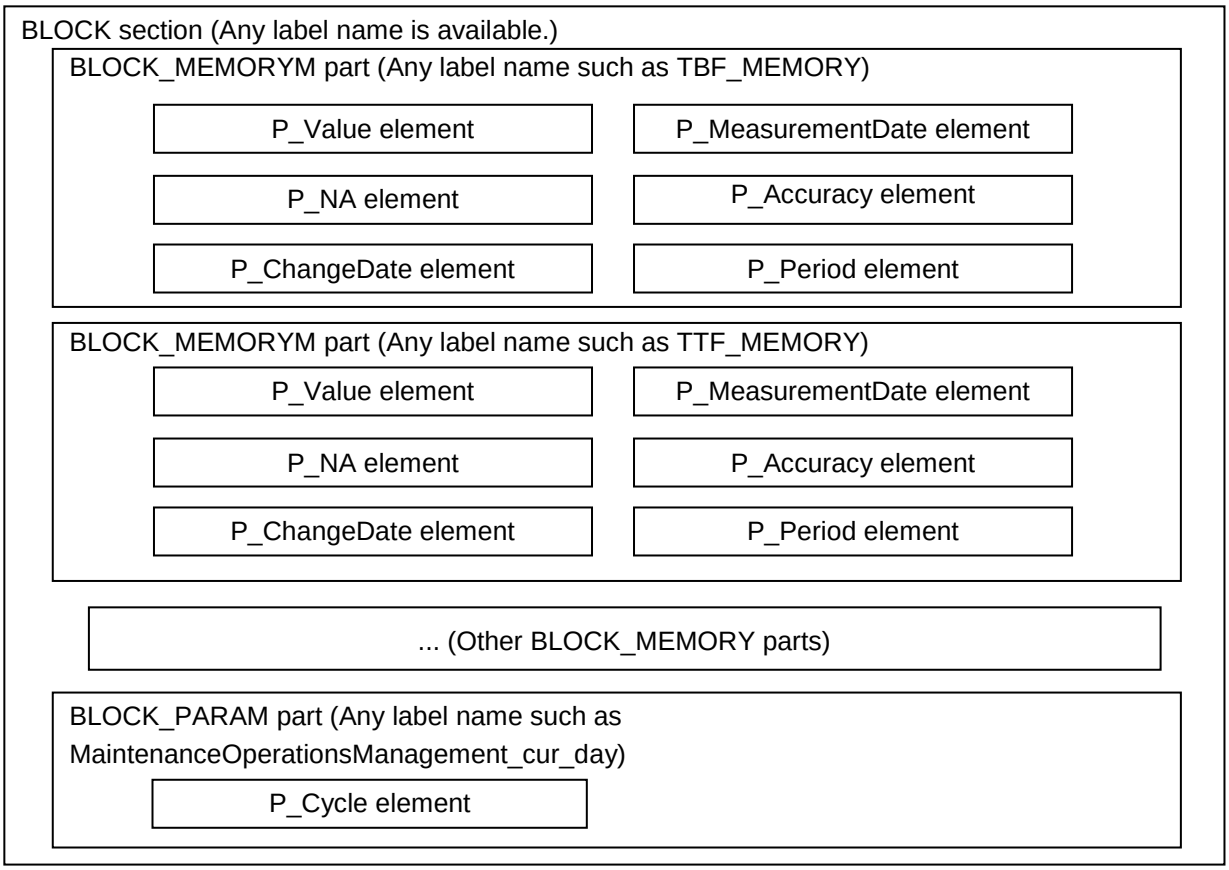

Figure 6-4 Image of the Structure When the Machine Information Regarding Maintenance Operation Management Is Described (BLOCK Section)

For descriptions about the COMM_IF_INFO part, refer to Table 6-3 "Description Specification for the COMM_IF_INFO Part" regarding production operation management.

Table 6-9 shows the description specification for the COMM_IF_CONFIGURATION part.

Table 6-9 List of Elements to Be Described in the COMM_IF_CONFIGURATION Part

No.	Part name	Description details	Required/ Optional
1.	"P_MaintenanceOperationsManagement_" plus "character string which indicates moment" plus "_" plus "character string which indicates the target"	Write the machine information regarding maintenance operation management. For the character strings which indicate moment, refer to Table 5-2, and for the character strings which indicate targets, refer to Table 5-3.	Optional

Table 6-10 shows a list of elements to be described in the COMM_IF_CONFIGURATION part. For the data types, refer to Table 6-6.

Table 6-10 List of Elements to Be Described in the COMM_IF_CONFIGURATION Part

No.	Machine information	Element name	Description details	Data type	CATEGORY	Required/ Optional
1.	Mean operating time between failures	P_MeanOperatingTime BetweenFailures	Write the mean operating time between failures.	Time unit type	KPI	Optional
2.	Mean time to failure	P_MeanTimeToFailure	Write the mean time to failure.	Time unit type	KPI	Optional
3.	Mean time to repair	P_MeanTimeToRestoration	Write the mean time to repair.	Time unit type	KPI	Optional
4.	Operating time between failures	P_TBF	Write the operating time between failures.	Time unit type	KPI	Optional
5.	Time to failure	P_TTF	Write the operating time between failures.	Time unit type	KPI ELEMENT	Optional
6.	Time to repair	P_TTR	Write the time to repair.	Time unit type	KPI ELEMENT	Optional
7.	Failure event	P_FE	Write the failure event.	Unsigned integral data type	KPI ELEMENT	Optional

Table 6-11 and Table 6-12 show description specifications for the BLOCK_MEMORY/BLOCK_PARAM parts.

Table 6-11 List of Elements to Be Described in the BLOCK_MEMORY/BLOCK_PARAM Parts

No.	Machine data	Description details	BLOCK_MEMORY part name corresponding to machine data (*1)	BLOCK_PARAM part name corresponding to machine data (*2)
1.	Mean operating time between failures	Write the mean operating time between failures.	Optional	Optional
2.	Mean time to failure	Write the mean time to failure.	Optional	Optional
3.	Mean time to repair	Write the mean time to repair.	Optional	Optional
4.	Operating time between failures	Write the operating time between failures.	Optional	Optional
5.	Time to failure	Write the operating time between failures.	Optional	Optional
6.	Time to repair	Write the time to repair.	Optional	Optional
7.	Failure event	Write the failure event.	Optional	Optional

*1: Although it is optional, it is recommended to delete "P_" from the LABEL name of machine information and use a part name having "_MEMORY" added to the end.
Example: For "P_TBF", which is the LABEL name of the actual unit busy time, using "TBF _MEMORY" is recommended as the BLOCK_MEMORY part name.

*2: The description is optional because the part can be shared by multiple machine information items unlike the BLOCK_MEMORY part. However, if the part is prepared as a part dedicated to specific machine information, it is recommended to delete "P_" from the LABEL name of machine information and use a part name having "_PARAM" added to the end.

Table 6-12 Option Information Regarding Machine Data (Maintenance Operation Management)

No.	Category	Part / Option information / Machine data	BLOCK_MEMORY					BLOCK_PARAM or BLOCK_MEMORY	BLOCK_PARAM
			P_Value	P_NA	P_ChangeDate	P_MeasurementDate	P_Period	P_Accuracy	P_Cycle
1	KPI	Mean operating time between failures	◎	○	○	◎	◎	-	◎
2		Mean time to failure	◎	○	○	◎	◎	-	◎
3		Mean time to repair	◎	○	○	◎	◎	-	◎
4	Element	Operating time between failures	◎	○	○	◎	◎	-	◎
5		Time to failure	◎	○	○	◎	◎	-	◎
6		Time to repair	◎	○	○	◎	◎	-	◎
7		Failure event	◎	○	○	◎	◎	-	◎

◎: Required ○: Recommended -: Not needed

6.4. Description Examples

6.4.1. Overall structure

A KPI for energy management "Comprehensive energy consumption", which is defined in ISO 22400, is useful information for application software. The KPI "Comprehensive energy consumption" is calculated with the formula below:

"Energy consumption" divided by "Produced quantity"

Below is the description example of CSP+ files for machine under the following conditions and requests.

- The (interim) comprehensive energy consumption on the current day needs to be displayed by the application software.
- The machine does not hold data of the comprehensive energy consumption but data of energy consumption and produced quantity separately.

First, the image of the overall structure of the description example explained here is shown in Figure 6-5.

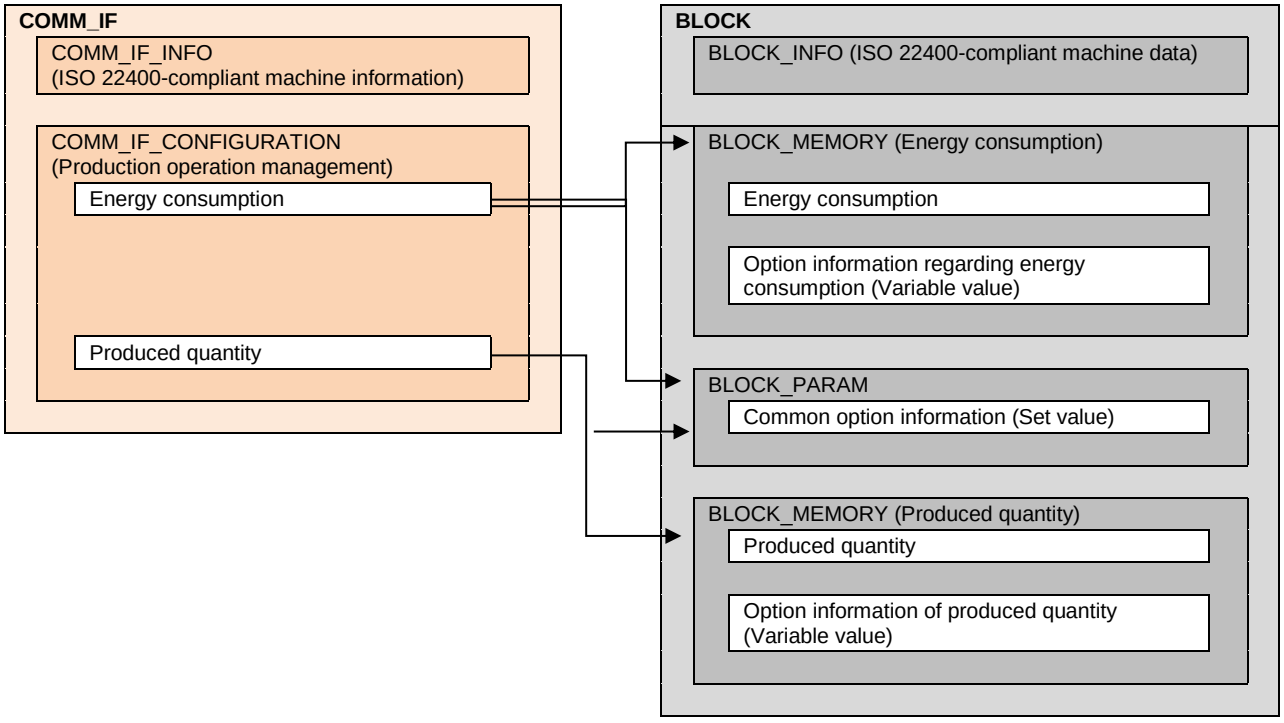

Figure 6-5 Image of Overall Structure of Description Example

6.4.2. Description example of COMM_IF section

6.4.2.1. COMM_IF_INFO part

The LABEL of the COMM_IF_INFO part has been defined as "P_ISO22400" by the specifications. No elements need to be described in the COMM_IF_INFO part.

A description example is shown below:

```
<p:commIfInfo label="P_ISO22400">
  <p:comment><p:item> ISO 22400-compliant machine information </p:item></p:comment>
 </p:commIfInfo>
```

6.4.2.2. COMM_IF_CONFIGURATION part

Regarding production operation management, machine information which indicates an interim result on the current day is to be described; therefore, for LABEL of the COMM_IF_CONFIGURATION part, describe "P_ProductionOperationsManagement_cur_day" based on the specifications. As elements in the part, describe the energy consumption (predetermined LABEL name: "P_E") and produced quantity (predetermined LABEL name: "P_PQ").

A description example is shown below:

```
<p:commIfConfiguration label="P_ProductionOperationsManagement_cur_day">
  <p:comment><p:item>Production operation management</p:item></p:comment>
  <p:commIf ConfigurationMember label="P_E">
    <p:name><p:item>Energy consumption </p:item></p:name>
    <p:datatype><p:item>UINT32</p:item></p:datatype>
    <p:engUnit<p:item>J</p:item></p:engUnit>
    <p:refMemory><p:item>ISO22400_BLOCK.E_MEMORY</p:item></p:refMemory>
    <p:refParam><p:item>ISO22400_BLOCK.POM_PARAM</p:item></p:refParam>
  </p:commIfConfigurationMember>
  <p:commIfConfigurationMember label="P_PQ">
    <p:name><p:item>Produced quantity</p:item></p:name>
    <p:datatype><p:item>UINT32</p:item></p:datatype>
    <p:engUnit<p:item>pcs</p:item></p:engUnit>
    <p:refMemory><p:item>ISO22400_BLOCK.PQ_MEMORY</p:item></p:refMemory>
    <p:refParam><p:item>ISO22400_BLOCK.POM_PARAM</p:item></p:refParam>
  </p:commIfConfigurationMember>
</p:commIfConfiguration>
```

6.4.3. Description example of BLOCK section

6.4.3.1. BLOCK_INFO part

For the BLOCK_INFO part, description of LABEL is optional, and "ISO22400_BLOCK" is assigned in the example. As for the BLOCK_INFO part, description of the DeviceInterface element is required.

A description example is shown below:

```
<p:blockInfo label="ISO22400_BLOCK">
  <p:comment><p:item>ISO 22400-compliant machine data</p:item></p:comment>
  <p:blockInfoMember label="DeviceInterface">
    <p:category><p:item>COMMON</p:item></p:category>
    <p:name><p:item>Communication method with a machine</p:item></p:name>
    <p:datatype><p:item>STRING(129)</p:item></p:datatype>
    <p:data><p:item>MyMachine.MyController</p:item></p:data>
  </p:blockInfoMember>
</p:blockInfo>
```

6.4.3.2. BLOCK_MEMORY part

Describe two types of the BLOCK_MEMORY part: "E_MEMORY" and "PQ_PARAM".

For the part "E_MEMORY", describe the P_Value element indicating the current value for energy consumption, P_MeasurementDate element indicating measurement time, and P_Period element indicating measurement period. The P_Value element has been stored in 2000, P_MeasurementDate element in 2002, and P_Period element in 2004 on the memory address.

An example is shown below:

```
<p:blockMemory label="E_MEMORY">
  <p:comment><p:item>Energy consumption (Variable value)</p:item></p:comment>
  <p:blockMemoryMember label="P_Value">
    <p:name><p:item>Current value</p:item></p:name>
    <p:datatype><p:item>UINT32</p:item></p:datatype>
    <p:engUnit<p:item>J</p:item></p:engUnit>
    <p:assign><p:item>DA16:AA00000010</p:item></p:assign>
  </p:blockMemoryMember>
  <p:blockMemoryMember label="P_MeasurementDate">
    <p:name><p:item>Measurement time</p:item></p:name>
    <p:datatype><p:item>DATE</p:item></p:datatype>
    <p:assign><p:item>DA16:AA00000020</p:item></p:assign>
  </p:blockMemoryMember>
  <p:blockMemoryMember label="P_Period">
    <p:name><p:item>Measurement period</p:item></p:name>
    <p:datatype><p:item>UINT32</p:item></p:datatype>
    <p:engUnit<p:item>s</p:item></p:engUnit>
    <p:assign><p:item>DA16:AA00000030</p:item></p:assign>
  </p:blockMemoryMember>
</p:blockMemory>
```

For the part "PQ_MEMORY", describe the P_Value element indicating the current value for produced quantity, P_MeasurementDate element indicating measurement time, and P_Period element indicating measurement period. The P_Value element has been stored in 2010, P_MeasurementDate element in 2012, and P_Period element in 2014 on the memory address.

An example is shown below:

```
<p:blockMemory label="PQ_MEMORY">
  <p:comment><p:item>Produced quantity (Variable value)</p:item></p:comment>
  <p:blockMemoryMember label="P_Value">
    <p:name><p:item>Current value</p:item></p:name>
    <p:datatype><p:item>UINT32</p:item></p:datatype>
    <p:engUnit<p:item>J</p:item></p:engUnit>
    <p:assign><p:item>DA16:AA00000040</p:item></p:assign>
  </p:blockMemoryMember>
  <p:blockMemoryMember label="P_MeasurementDate">
    <p:name><p:item>Measurement time</p:item></p:name>
    <p:datatype><p:item>DATE</p:item></p:datatype>
    <p:assign><p:item>DA16:AA00000050</p:item></p:assign>
  </p:blockMemoryMember>
  <p:blockMemoryMember label="P_Period">
    <p:name><p:item>Measurement period</p:item></p:name>
    <p:datatype><p:item>UINT32</p:item></p:datatype>
    <p:engUnit<p:item>s</p:item></p:engUnit>
    <p:assign><p:item>DA16:AA00000060</p:item></p:assign>
  </p:blockMemoryMember>
</p:blockMemory>
```

6.4.3.3. BLOCK_PARAM part

For the part "POM_PARAM", describe the P_Cycle element indicating refreshing cycle relating to energy consumption and produced quantity. The refreshing cycle has been set to 60 seconds.

An example is shown below:

```
<p:blockParam label="POM_PARAM">
  <p:comment><p:item>Set value common to production operation</p:item></p:comment>
  <p:blockParamMember label="P_Cycle">
    <p:name><p:item>Refreshing cycle</p:item></p:name>
    <p:datatype><p:item>UINT16</p:item></p:datatype>
    <p:engUnit<p:item>s</p:item></p:engUnit>
    <p:assign><p:item>60</p:item></p:assign>
  </p:blockMemoryMember>
</p:blockParam>
```

REFERENCES

None.

CC-Link
CC-Link IE

Prepared in July, 2017