PI-PCS Interface

Release 4.0

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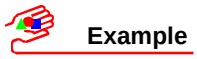
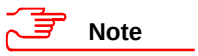
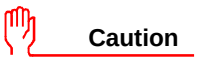
Typographic Conventions

This convention	is used for
Screen Text	words or characters you see on the screen (this includes system messages, field names, screen titles, menu names, and menu items).
`User Entry`	exact user input. These are words and characters you type on the keyboard exactly as they are in the documentation.
`<Variable User Entry>`	variable user input. Pointed brackets indicate that you replace these variables with appropriate keyboard entries.
ALL CAPITALS	report names, program names, transaction codes, table names, ABAP/4 language elements, file names, and directories.
Book Title	cross-references to other books
KEY CAP	keys on your keyboard. Most often, function keys (for example, **F2** and the **ENTER** key) are represented this way.

This icon...	helps you identify...
 **Example**	an Example. Examples help clarify complicated concepts or activities.
 **Note**	a Note. Notes can contain important information like special considerations or exceptions.
 **Caution**	a Caution. Cautions should help you avoid errors. for example, those that could lead to data loss.

Contents

Overview

Many different types of control system are used in the process industry. While some production lines are controlled by fully automated, sophisticated process control systems, others are still mainly manually operated with a low level of automation.

SAP has designed the PI-PCS interface to link PP-PI with manually operated, partially-automated, and fully automated lines. In SAP Customizing, you can adapt this interface to meet individual requirements by:

- Defining information for control (control recipes) and
- Defining information from control (process messages)

The interface thus enables flexible linking of systems. It meets the degree of automation of the line by offering the possibilities of:

- Complete process link and
- External entry of control recipe data

The PI-PCS interface described here is used to transfer all the information relevant to production. If the SAP Quality Management component is to be installed, you can use the QM-IDI interface.

Confirmation of order-related data via the PI-PCS interface replaces order-related confirmations via PP-PDC.

The PI-PCS interface enables the download of control recipes to the lower-level control system and the upload of process-related data in the form of process messages. In addition, it can be used to download general data on characteristics that make up control recipes and process messages.

Control recipes are used for transferring the following data:

- Process and control parameters
- Texts with instructions for the line operator in the case of lines that are manually operated (either fully or partially)
- Information on process messages that are to be returned

Process messages are used for creating electronic batch and production records and for updating the process order and material stocks. They supply information on:

- Status of process orders
- Consumption and production of materials
- Status of resources
- Selected process events

You can transfer the following **general characteristic data** to an external system:

- Technical data such as the format and characteristic group
- Allowed characteristic values

Process Messages and Process Message Categories

Process messages supply information on:

- Status of process orders
- Consumption and production of materials
- Status of resources
- Selected process events

The information contained in a process message is specified via the process message characteristics assigned to the message and their values.

Each process message refers to a **process message category** defined in SAP Customizing. A process message category describes the:

- Information contained in a process message by assigning process message characteristics
- Subsequent processing of the message by assigning destinations

There are two different kinds of process message category:

- Predefined by SAP
- Defined by the users according to their specific information requirements, when the SAP System is set up

Predefined Process Message Categories

The message categories predefined by SAP are used for the integration of process data into the following logistics components of the R/3 System:

- Production Planning
- Materials Management (Inventory Management)
- Quality Management

They trigger the following transactions in these components:

Process message categories predefined by SAP:

Message category	Business transaction
PI_CRST	Update of control recipe status
PI_OPST	Update of system status of an operation
PI_PHST	Confirmation of system status of a phase (processing time event)
PI_PHACT	Confirmation of the activity performed for a phase (time event for variable activity)
PI_SRST	Confirmation of system status of a secondary resource (processing time event)

Message category	Business transaction
PI_SRACT	Confirmation of the activity performed using a secondary resource (time event for variable activity)
PI_OPUST	Update of user status of an operation
PI_PHUST	Update of user status of a phase
PI_CONS	Goods issue posting
PI_PROD	Goods receipt posting
PI_QMSMR	Confirmation of inspection results to QM

Process messages consist of process message characteristics. The tables below list the characteristics contained in the message categories predefined by SAP. The process message characteristics marked as *Req* (required) describe the minimum scope of the respective message.

For information on the exact structure of the messages in different business scenarios as well as the processing logic for the different messages, see the R/3 Library *PP Process Management.*

Characteristics of message category PI_CRST:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	
PPPI_CONTROL_RECIPE	Control recipe	X
PPPI_CONTROL_RECIPE_STATUS	Status of the control recipe	X
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_OPST:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	X
PPPI_OPERATION_STATUS	Status of the operation	X
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Message category PI_OPST is used for documentation only. Time events are confirmed at phase level. The operation status is updated in accordance with the status of the subordinate phase.

Characteristics of message category PI_PHST:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	X
PPPI_PHASE_STATUS	Status of the phase	X
PPPI_YIELD_TO_CONFIRM	Yield to be confirmed	
PPPI_UNIT_OF_MEASURE	Unit of measure	
PPPI_REASON_FOR_VARIANCE	Reason for the variance	
PPPI_CONFIRMATION_SHORT_TEXT	Confirmation short text	
PPPI_PHASE_RESOURCE	Resource	
PPPI_PLANT_OF_RESOURCE	Plant of the resource	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_PHACT:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	X
PPPI_STD_VALUE_PARAMETER_ID	Standard value/parameter ID	X
PPPI_ACTIVITY	Activity to be confirmed	X
PPPI_UNIT_OF_MEASURE	Unit of measure	X
PPPI_CONFIRMATION_SHORT_TEXT	Confirmation short text	
PPPI_STD_VALUE_PARAMETER_ID	Standard value/parameter ID	X
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_SRST:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Order number	
PPPI_PHASE	Phase number	X
PPPI_SECONDARY_RESOURCE	Item number of the secondary resource	X
PPPI_SECONDARY_RESOURCE_STATUS	Status of the secondary resource	X
PPPI_REASON_FOR_VARIANCE	Reason for the variance	
PPPI_CONFIRMATION_SHORT_TEXT	Confirmation short text	
PPPI_RESOURCE	Resource	
PPPI_PLANT_OF_RESOURCE	Plant of the resource	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_SRACT:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	X
PPPI_SECONDARY_RESOURCE	Item number of the secondary resource	X
PPPI_STD_VALUE_PARAMETER_ID	Standard value/parameter ID	X
PPPI_ACTIVITY	Activity to be confirmed	X
PPPI_UNIT_OF_MEASURE	Unit of measure	X
PPPI_CONFIRMATION_SHORT_TEXT	Confirmation short text	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_OPUST:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	X
PPPI_OPERATION_USER_STATUS	User status of the operation	X
PPPI_LANGUAGE_OF_USER_STATUS	Maintenance language for user status	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_PHUST:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	X
PPPI_PHASE_USER_STATUS	User status of the phase	X
PPPI_LANGUAGE_OF_USER_STATUS	Maintenance language for user status	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_CONS:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	
PPPI_MATERIAL	Material	X
PPPI_BATCH	Batch	
PPPI_STORAGE_LOCATION	Storage location	
PPPI_RESERVATION	Reservation	
PPPI_RESERVATION_ITEM	Item no. of the reservation	
PPPI_MATERIAL_CONSUMED	Material quantity consumed	X

Characteristic	Meaning	Req
PPPI_UNIT_OF_MEASURE	Unit of measure	X
PPPI_FINAL_ISSUE	Indicator: final issue	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_PROD:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	
PPPI_MATERIAL	Material	X
PPPI_BATCH	Batch	
PPPI_STORAGE_LOCATION	Storage location	
PPPI_ORDER_ITEM_NUMBER	Number of the order item	
PPPI_MATERIAL_PRODUCED	Material quantity produced	X
PPPI_UNIT_OF_MEASURE	Unit of measure	X
PPPI_DELIVERY_COMPLETE	Indicator: delivery complete	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Characteristics of message category PI_QMSMR:

Characteristic	Meaning	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	
PPPI_INSPECTION_LOT	Inspection lot	X
PPPI_INSPECTION_CHARACTERISTIC	Inspection characteristic	X
PPPI_INSPECTION_RESULT	Inspection result	X
PPPI_UNIT_OF_MEASURE	Unit of measure	
PPPI_NUMBER_OF_INSPECTIONS	No. of measurements	

Characteristic	Meaning	Req
PPPI_STANDARD_DEVIATION	Standard deviation	
PPPI_INSPECTION_SHORT_TEXT	Short text of the inspection	
PPPI_EVENT_DATE	Event date	X
PPPI_EVENT_TIME	Event time	X

Message category PI_QMSMR is used to report summarized measured inspection results. The inspection results are displayed as default values in the QM inspection results record.

Explanation of the Process Message Characteristics

Formats of the process message characteristics:

Characteristic	Format	Length	Decimals
PPPI_ACTIVITY	NUM	13	3
PPPI_BATCH	CHAR	10	
PPPI_CONFIRMATION_SHORT_TEXT	CHAR	30	
PPPI_CONTROL_RECIPE	CHAR	18	
PPPI_CONTROL_RECIPE_STATUS	CHAR	05	
PPPI_DATA_POINT_NAME	CHAR	30	
PPPI_DATA_POINT_VALUE	NUM	13	3
PPPI_DELIVERY_COMPLETE	CHAR	02	
PPPI_EVENT_DATE	DATE	08	
PPPI_EVENT_TIME	TIME	06	
PPPI_EXTERNAL_OPERATION	CHAR	30	
PPPI_EXTERNAL_PHASE	CHAR	30	
PPPI_EXTERNAL_RECIPE	CHAR	30	
PPPI_FINAL_ISSUE	CHAR	01	
PPPI_INSPECTION_CHARACTERISTIC	CHAR	04	
PPPI_INSPECTION_LOT	CHAR	12	
PPPI_INSPECTION_RESULT	NUM	15	4
PPPI_INSPECTION_SHORT_TEXT	CHAR	30	
PPPI_LANGUAGE_OF_USER_STATUS	CHAR	01	
PPPI_MATERIAL	CHAR	18	

Characteristic	Format	Length	Decimals
PPPI_MATERIAL_CONSUMED	NUM	11	4
PPPI_MATERIAL_ITEM	CHAR	04	
PPPI_MATERIAL_PRODUCED	NUM	11	4
PPPI_MATERIAL_QUANTITY	NUM	13	3
PPPI_MATERIAL_SHORT_TEXT	CHAR	30	
PPPI_MESSAGE_DESTINATION	CHAR	04	
PPPI_MESSAGE_TEXT	CHAR	30	
PPPI_NUMBER_OF_INSPECTIONS	NUM	04	0
PPPI_OPERATION	CHAR	04	
PPPI_OPERATION_LONG_TEXT	CHAR	30	
PPPI_OPERATION_SHORT_TEXT	CHAR	30	
PPPI_OPERATION_STATUS	CHAR	05	
PPPI_OPERATION_USER_STATUS	CHAR	04	
PPPI_ORDER_ITEM_NUMBER	CHAR	04	
PPPI_ORDER_QUANTITY	NUM	13	3
PPPI_PARAMETER_NAME	CHAR	30	
PPPI_PARAMETER_VALUE	NUM	13	3
PPPI_PARAMETER_VALUE_MIN	NUM	13	3
PPPI_PARAMETER_VALUE_MAX	NUM	13	3
PPPI_PHASE	CHAR	04	
PPPI_PHASE_LONG_TEXT	CHAR	30	
PPPI_PHASE_RESOURCE	CHAR	08	
PPPI_PHASE_RESOURCE_LONG_TEXT	CHAR	30	
PPPI_PHASE_RESOURCE_SHORT_TEXT	CHAR	30	
PPPI_PHASE_SHORT_TEXT	CHAR	30	
PPPI_PHASE_STATUS	CHAR	05	
PPPI_PHASE_USER_STATUS	CHAR	04	
PPPI_PLANT_OF_RESOURCE	CHAR	04	
PPPI_PROCESS_ORDER	CHAR	12	
PPPI_PROCESS_ORDER_TEXT	CHAR	30	

Characteristic	Format	Length	Decimals
PPPI_REASON_FOR_VARIANCE	CHAR	04	
PPPI_RESERVATION	CHAR	10	
PPPI_RESERVATION_ITEM	CHAR	04	
PPPI_RESOURCE	CHAR	08	
PPPI_RESOURCE_NETWORK	CHAR	10	
PPPI_SECONDARY_RESOURCE	CHAR	08	
PPPI_SECONDARY_RESOURCE_STATUS	CHAR	05	
PPPI_SIGNATURE	CHAR	30	
PPPI_SOURCE	CHAR	30	
PPPI_STANDARD_DEVIATION	NUM	15	4
PPPI_STD_VALUE_PARAMETER_ID	CHAR	06	
PPPI_STORAGE_LOCATION	CHAR	04	
PPPI_UNIT_OF_MEASURE	CHAR	06	
PPPI_YIELD_TO_CONFIRM	NUM	13	3

For detailed information on characteristic formats, see section *Transfer of Process Messages from Control System to R/3 PP-PI*.

PPPI_ACTIVITY

Activity to be confirmed

PPPI_CONFIRMATION_SHORT_TEXT

Short text of confirmation

PPPI_BATCH

Batch number of the material

PPPI_CONTROL_RECIPE

Unique identification of a control recipe. It is transferred to the control system in the control recipe header

PPPI_CONTROL_RECIPE_STATUS

Status of a control recipe

Allowed values:

Status	Meaning	Explanation

Status	Meaning	Explanation
00004	Terminated	The processing of a control recipe has already been started but cannot be finished according to plan.
00005	Processed	The execution of the control recipe has been completed.
00007	Discarded	The control recipe cannot be processed, due to a syntax error, for example.

PPPI_DATA_POINT_NAME

Name of a data point

PPPI_DATA_POINT_VALUE

Value of a data point

PPPI_DELIVERY_COMPLETE

Delivery completion indicator. Specifies that no further goods receipts are expected for the order item.

PPPI_EVENT_DATE, PPPI_EVENT_TIME

Date and time of the event to which the message refers

PPPI_EXTERNAL_OPERATION

Operation name in control system

PPPI_EXTERNAL_PHASE

Phase name in control system

PPPI_EXTERNAL_RECIPE

Recipe name in control system

PPPI_FINAL_ISSUE

Final issue indicator. Further goods movements for this reservation item are not to be expected. They are, however, possible.

PPPI_INSPECTION_CHARACTERISTIC

Number of the inspection characteristic to which the inspection result should be assigned

PPPI_INSPECTION_LOT

Number of the inspection lot for which the result has been recorded

PPPI_INSPECTION_RESULT

Average of measured values

PPPI_INSPECTION_SHORT_TEXT

Short text with a comment on the measurement result entered during manual results recording

PPPI_LANGUAGE_OF_USER_STATUS

Maintenance language of the user status

PPPI_MATERIAL

Unique material number

PPPI_MATERIAL_ITEM

Item number of a material component

PPPI_MATERIAL_PRODUCED, PPPI_MATERIAL_CONSUMED

Material quantity produced or consumed. The quantity is quoted in the unit of measure specified in the message (see characteristic PPPI_UNIT_OF_MEASURE).

PPPI_MATERIAL_QUANTITY

Material quantity

PPPI_MATERIAL_SHORT_TEXT

Material description

PPPI_MESSAGE_DESTINATION

Message destination

PPPI_MESSAGE_TEXT

Message long text

PPPI_NUMBER_OF_INSPECTIONS

Number of measurements used in determining the average

PPPI_ORDER_QUANTITY

Order quantity

PPPI_OPERATION, PPPI_PHASE

Unique number of an operation or phase. If both operation number and phase number are assigned to a message category as optional characteristics, messages of this category can refer to a phase or an operation. If the phase number is specified in a message, the operation number is optional.

PPPI_OPERATION_LONG_TEXT, PPPI_PHASE_LONG_TEXT

Long text for an operation or phase

PPPI_OPERATION_SHORT_TEXT, PPPI_PHASE_SHORT_TEXT

Short text for an operation or phase

PPPI_OPERATION_STATUS, PPPI_PHASE_STATUS

System status of an operation or phase

Allowed values:

Status	Meaning
00001	Started
00002	Finished
00003	Interruption
00004	Partial finish

You must set the status “Partial finish” for an operation or phase if you want to confirm the quantity produced so far even though the operation or phase cannot yet be set to “Finished”.

PPPI_OPERATION_USER_STATUS, PPPI_PHASE_USER_STATUS

User status of an operation or phase. The values allowed depend on the status profile of the operation or phase.

PPPI_ORDER_ITEM_NUMBER

Number of the order item

PPPI_ORDER_QUANTITY

Order quantity

PPPI_PARAMETER_NAME

Parameter name

PPPI_PARAMETER_VALUE

Parameter value

PPPI_PARAMETER_VALUE_MIN

Lower tolerance limit

PPPI_PARAMETER_VALUE_MAX

Upper tolerance limit

PPPI_PHASE_RESOURCE

Primary resource of a phase

PPPI_PHASE_RESOURCE_LONG_TEXT, PPPI_PHASE_RESOURCE_SHORT_TEXT

Long or short text for a phase

PPPI_PLANT_OF_RESOURCE

Plant of the resource

PPPI_PROCESS_ORDER

Unique identification of a process order. It is contained in the control recipe header

PPPI_PROCESS_ORDER_TEXT

Short text for a process order

PPPI_REASON_FOR_VARIANCE

Reason for variance

PPPI_RESERVATION

Reservation number to which the material consumption refers

PPPI_RESERVATION_ITEM

Reservation item to which the material consumption refers

PPPI_RESOURCE

Resource to be confirmed

PPPI_RESOURCE_NETWORK

Resource network

PPPI_SECONDARY_RESOURCE

Item number assigned to a secondary resource in the process order

PPPI_SECONDARY_RESOURCE_STATUS

System status of a secondary resource in the process order

Allowed values:

Status	Meaning
00001	Start
00002	Finish
00003	Interruption
00004	Partial finish

You must set the status “Partial finish” if you want to confirm the activity performed so far even though secondary resource usage has not yet been finished.

PPPI_SIGNATURE

Signature

PPPI_SOURCE

Source

PPPI_STANDARD_DEVIATION

Standard deviation (QM)

PPPI_STD_VALUE_PARAMETER_ID

Standard value/parameter ID

PPPI_STORAGE_LOCATION

Storage location of the material.

PPPI_SUCCESSOR

Number of the succeeding phase

PPPI_UNIT_OF_MEASURE

Unit of measure

PPPI_YIELD_TO_CONFIRM

Yield to be confirmed

Control Recipes

In the control recipe, the information required to execute a process order is transferred to the executing control system.

The following data is defined in a control recipe:

- Required control and process parameters
- Texts with instructions for the line operator in the case of manually operated lines (either fully or partially)
- Process messages to be returned to PP-PI

A control recipe is assigned exactly one destination at the process control level. If several process control systems are involved in the execution of a process order, separate control recipes can be created and sent to the respective control system. Several control recipes can be transferred per process order to the same control address.

Process Instructions and Process Instruction Categories

Control recipes consist of process instructions.

Every process instruction used in a control recipe belongs to a **process instruction category** defined in SAP Customizing. Process instruction categories are defined when the R/3 System is set up. They are adjusted to the degree of automation of the line.

Process instruction categories specify:

- The information contained in a process instruction via the assignment of process instruction characteristics
- The process instruction type

The following types of process instruction are relevant to external control systems:

- Process parameter
- Process data request
- Process message subscription
- Process data calculation formula

For examples of the different types of process instruction, see the R/3 Library *PP Process Management*.

Process Parameter

In control recipes for automated control systems, process instructions of this type are used to transfer control and process parameters to the control system.

With production lines that are manually operated (either fully or partially), process parameters contain instructions for the line operator.

Process Data Request

Process data requests refer to planned events. They define which messages containing up-to-date process data are to be transferred from the control system to R/3 PP-PI. They specify:

- Categories of the process messages that must be created
- Process message characteristics that must be contained in the message
- Information that the control system must provide as characteristic values in the messages
- Additional data (characteristic values) that is not known to the control system and has to be included in the messages when they are created

Process Message Subscription

Process message subscriptions specify that process control is to send a message every time a specific event occurs, for example, a goods receipt.

Process message subscriptions contain information on:

- The message category to be used
- The contents of the message

You cannot use process message subscriptions for PI sheets.

Process Data Calculation Formula

Process instructions of this type define that a value is to be calculated and reported when a control recipe is processed. They are used in control recipes that are to be processed by the line operator in a manually operated line.

The process data calculation formula specifies:

- The value to be calculated
- The formula to be used for the calculation
- The process message to be used to report the calculated value

For examples of how to use process data calculation formulas for the R/3 PI sheet, see the R/3 Library *PP Process Management*.

Communication via RFC

PP-PI and the control system communicate with each other via Remote Function Call (RFC). RFC is a method of communication developed by SAP that provides convenient data transfer between different systems. The communication partners swap data using Common Program Interface Communication (CPI-C). Due to the RFC technology at the R/3 level, the application does not require communication handling. On the control computer level, SAP supports the automatic generation of an RFC example program with a code generator. The function module in the SAP R/3 System with which data is to be exchanged is used as the basis for the generation of the example program. The generated programs support synchronous RFCs but do not support transactional RFCs. Where the transactional RFC is needed (see below), the programs must be adjusted accordingly. Afterwards, they must be compiled and linked in the control computer and can then be used for the actual application as an Application Program Interface (API).

RFC function modules of the PI-PCS interface:

	Call		
Function	**From**	**To**	**Function name**
Ctrl rec. download	PP-PI	CS	CONTROL_RECIPE_DOWNLOAD1)
	PP-PI	CS	CONTROL_RECIPE_AVAILABLE2)
	CS	PP-PI	CONTROL_RECIPE_PULL3)
	CS	PP-PI	CONTROL_RECIPE_PULL_SINGLE4)
Message upload	CS	PP-PI	PROCESS_MESS_UPLOAD
	PP-PI	CS	PROCESS_MESS_GET_RETURN_CODE5)
Message download	PP-PI	CS	PROCESS_MESS_DOWNLOAD
Download of detail data on characteristics	CS	PP-PI	PROC_CHAR_GET_LIST_WITH_DETAIL
Download of allowed char. values	CS	PP-PI	PROC_CHAR_HELPVALUES_GET

CS Control system

1) Download of one or more control recipes initiated by PP-PI
2) Information that a new control recipe is available
3) Download of one or more control recipes initiated by the control system
4) Download of a specific control recipe initiated by the control system
5) Download of the return code for message processing in transactional message upload

Characteristic data and values are downloaded as synchronous RFCs. All other calls from PP-PI to the control system and from the control system to PP-PI are carried out as transactional RFCs (tRFCs). The tRFC ensures that each call is carried out only once. The sequence of calls is not changed. If the target system is not active when the call takes place, the RFC is repeated according to a repetition rate or duration that can be set by the user. The current status of a tRFC can be checked any time via the log file.

Note

Up to Release 4.0A, process message upload (function module PROCESS_MESSAGE_UPLOAD) was carried out as a synchronous RFC. This type of message transfer continues to be supported for existing links to control systems. As of Release 4.0A however, certification requires the control system to support message transfer via tRFC.

For further information on RFC and tRFC technology, please refer to the corresponding section in the R/3 library.

RFC mode of the function modules

Function name	RFC program at control level
CONTROL_RECIPE_DOWNLOAD	server program
CONTROL_RECIPE_AVAILABLE	server program
CONTROL_RECIPE_PULL	client program
CONTROL_RECIPE_PULL_SINGLE	client program
PROCESS_MESS_UPLOAD	client program
PROCESS_MESS_GET_RETURN_CODE	server program
PROCESS_MESS_DOWNLOAD	server program
PROC_CHAR_GET_LIST_WITH_DETAIL	client program
PROC_CHAR_HELPVALUES_GET	client program

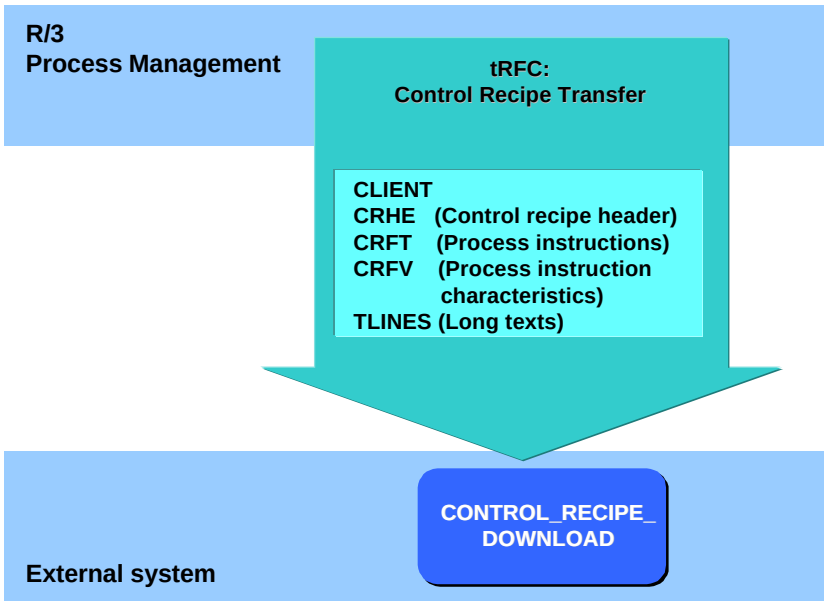
Transfer of Control Recipes from R/3 PP-PI to the Control System

There are three different ways of transferring control recipes from R/3 PP-PI to the control system:

- Download of all control recipes for a specific control system, initiated by R/3 PP-PI
- Download of all available control recipes, initiated by the control system
- Download of a specific control recipe, initiated by the control system

Download of all Control Recipes Initiated by R/3 PP-PI

Here, PP-PI calls the corresponding API of a control system as soon as one control recipe has been created for the control system. This way, any number of control recipes can be transferred in one function call. The function module used to carry out the tRFC is CONTROL_RECIPE_DOWNLOAD (see graphic).



The table below lists the data exchanged via the interface of the function module from the point of view of PP-PI. For more detailed information on the interface parameters, see section *Explanation of the Interface Parameters*.

Export Parameters:

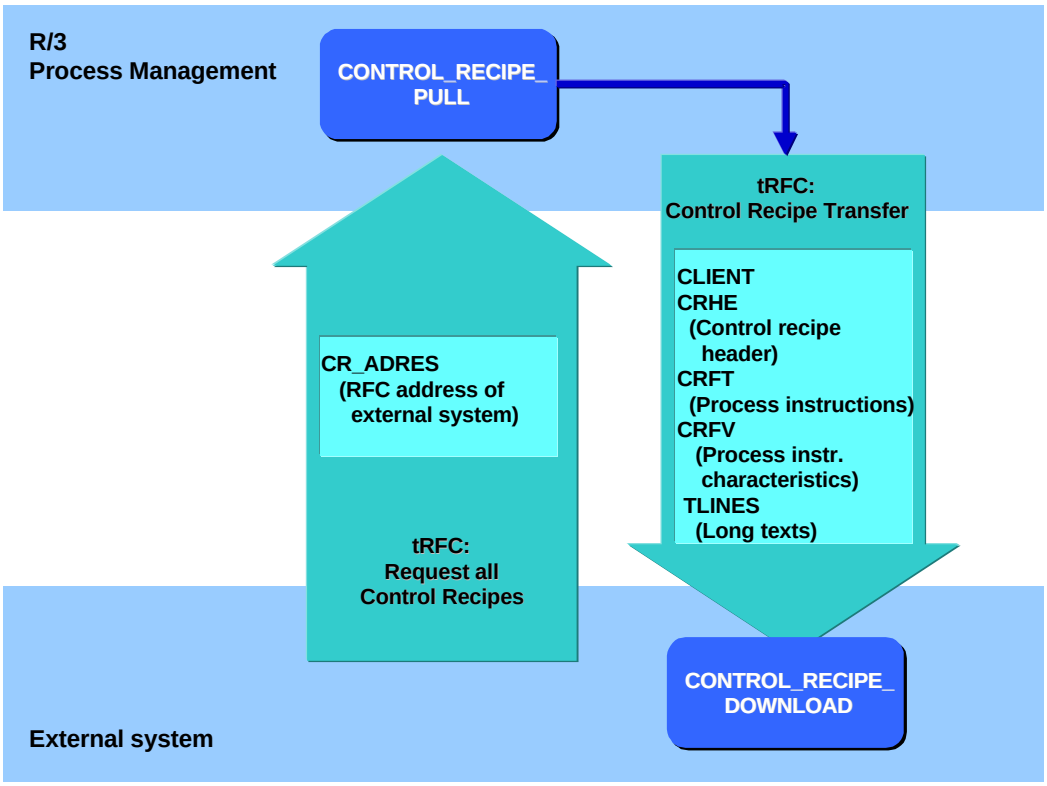
Name	Format	Length	Description
CLIENT	CHAR	03	SAP client

Tables:

Name	Description	No. of entries
CRHE	Control recipe header	1/ctrl rec.
CRFT	Process instructions	min.1/ctrl rec.
CRFV	Process instr. characteristics	min.1/proc. inst.
TLINES	Text with instructions	

Download of all Control Recipes Initiated by the Control System

Here, the download is initiated by the control system. The control system calls function module CONTROL_RECIPE_PULL in R/3 PP-PI, which in turn starts the download of all available control recipes for the control system. The download is carried out via a tRFC using function CONTROL_RECIPE_DOWNLOAD (see graphic).



The interface of function module CONTROL_RECIPE_DOWNLOAD is described in section *Download of all Control Recipes Initiated by R/3 PP-PI*.

The following table lists the data exchanged via the function module CONTROL_RECIPE_PULL from the point of view of PP-PI:

Import Parameters:

Name	Format	Length	Description
CR_ADRES	CHAR	32	RFC control system address

For more detailed information on the interface parameters, see section *Explanation of the Interface Parameters*.

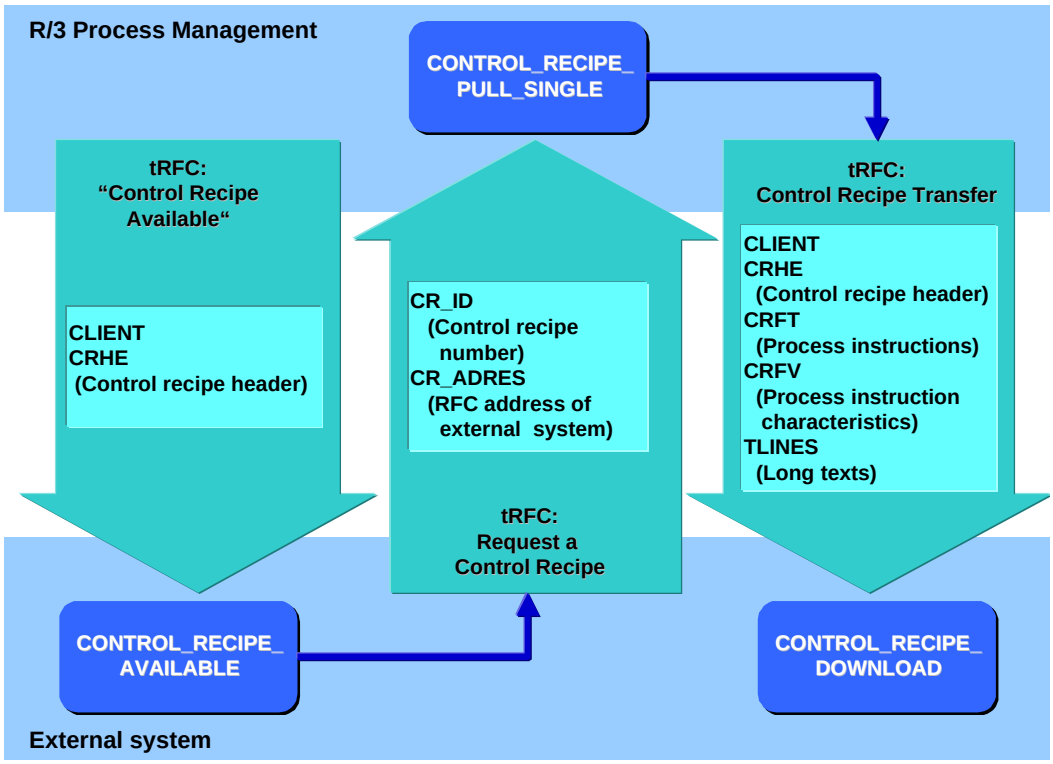
The following exceptions can be triggered:

Exceptions:

Name	Description
DESTINATION_NOT_VALID	Address not valid for this type of communication
DESTINATION_UNKNOWN	Address not known
SYSTEM_FAILURE	System error
TEXT_WORK_UP_FAILURE	Error when preparing control recipe texts

Download of a Specific Control Recipe, Initiated by the Control System

In this case, function CONTROL_RECIPE_AVAILABLE informs the control system that a new control recipe has been created. By calling function module CONTROL_RECIPE_PULL_SINGLE, the control system can request a specific control recipe to be downloaded by PP-PI. The download is carried out via tRFC using function CONTROL_RECIPE_DOWNLOAD (see graphic).



The interface of function module CONTROL_RECIPE_DOWNLOAD is described in section *Download of all Control Recipes Initiated by R/3 PP-PI*.

The following table lists the data exchanged via function module CONTROL_RECIPE_AVAILABLE from the point of view of PP-PI:

Export Parameters:

Name	Format	Length	Description
CLIENT	CHAR	03	SAP client

Tables:

Name	Description
CRHE	Control recipe header

The following table lists the data exchanged via function module CONTROL_RECIPE_PULL_SINGLE from the point of view of PP-PI:

Import Parameters:

Name	Format	Length	Description
CR_ID	CHAR	18	Control recipe number
CR_ADRES	CHAR	32	RFC address of the ctrl system

For more detailed information on the interface parameters, see section *Explanation of the Interface Parameters*.

The following exceptions can be triggered:

Exception:

Name	Description
CONTROL_RECIPE_NOT_FOUND	Control recipe does not exist
CONTROL_RECIPE_STATE_NOT_VALID	Control recipe status does not permit download
DESTINATION_NOT_VALID	Invalid address for this type of communication
DESTINATION_UNKNOWN	Address not known
SYSTEM_FAILURE	System error
TEXT_WORK_UP_FAILURE	Error when preparing control recipe texts

Explanation of the Interface Parameters

Table Structures

Table CRHE:

Field	Format	Length	Description
CRID	CHAR	18	Control recipe number
WERK	CHAR	04	Plant
BID	CHAR	12	Process order
ADRES	CHAR	32	Address of the control system
TSTKZ	CHAR	01	Test indicator
CRSTAT	CHAR	05	Control recipe status

Field	Format	Length	Description
KTXT	CHAR	40	Short description of process order
MATNR	CHAR	18	No. of the material to be produced
MATXT	CHAR	40	Description of the material to be produced

Table CRFT:

Field	Format	Length	Description
CRID	CHAR	18	Control recipe number
FTNO	CHAR	08	Process instruction number
FTTYP	CHAR	01	Process instruction type
COSTR	CHAR	08	Process instruction category

Table CRFV:

Field	Format	Length	Description
CRID	CHAR	18	Control recipe number
FTNO	CHAR	08	Process instruction number
FVNO	CHAR	04	Characteristic number
ATNAM	CHAR	30	Characteristic name
ATWRT	CHAR	30	Characteristic value
ATFOR	CHAR	04	Characteristic format

Table CRFV contains the process instruction characteristics and their values. The characteristic value is always transferred as left-justified in the 30-CHAR field ATWRT. With characteristic format NUM, ATWRT contains the characteristic value in floating-point format.

Table TLINES:

Field	Format	Length	Description
CRID	CHAR	18	Control recipe number
FTNO	CHAR	08	Process instruction number
FVNO	CHAR	04	Characteristic number
TDFORMAT	CHAR	02	Format column for text processing in

			SAPscript editor
TDLINE	CHAR	132	Text line

Table TLINES is used to transfer texts for the line operator of lines that are manually operated (either fully or partially). You can define any number of text lines for a process instruction characteristic.

Explanation of Individual Fields

CRID

Control recipe number. PP-PI assigns a unique number to each control recipe. The control recipe number groups the table entries that belong to one control recipe.

ADRES

RFC destination of the API that receives the control recipe

TSTKZ

Test indicator:

Allowed values	**Meaning**
X	Test mode
SPACE	Normal mode

If the test indicator is set for a control recipe, this control recipe is to be processed in the test mode. All process messages created for this control recipe must also be marked with a test indicator. This means that they can be displayed in the PP-PI message monitor, but they are not processed.

CRSTAT

Control recipe status:

Allowed values	**Meaning**
00001	Created, can be requested by the control system
00003	Sent

KTXT

Short description of the process order

MATNR

Number of the material to be produced

MATXT

Short description of the material to be produced

FTNO

Process instruction number. Unique within a control recipe.

FTTYP

Process instruction type:

Allowed values	Meaning
01	Process parameter
02	Process data request
03	Process message subscription
04	Process data calculation formula

For information on the individual process instruction types, see section *Process Instructions and Process Instruction Categories*.

COSTR

Process instruction category to which the process instruction refers. For information on process instruction categories, see section *Process Instructions and Process Instruction Categories*.

FVNO

Characteristic number. Unique within one process instruction.

ATNAM

Identification of a characteristic

ATWRT

Characteristic value

ATFOR

Characteristic format:

Allowed values	Meaning
CHAR	Character
NUM	Numeric *

DATE	Date (YYYYMMDD)
TIME	Time (HHMMSS)

* Value is stored as a floating-point value in the ATWRT field

TDLINE

Text line. Any number of text lines can be stored in the TLINES table for a characteristic of a process instruction of type "process parameter".

Authorization Check During Control Recipe Download

Depending on the download procedure you use, the R/3 System carries out an authorization check before transferring control recipes to a control system. The authorization check has been implemented as follows:

- Download of all control recipes initiated by the R/3 System

  No authorization check is carried out.
- Download of all or specific control recipes initiated by the control system

  The R/3 System checks the authorizations of the R/3 user with which the control system requests control recipes. The system only transfers control recipes if the user has the corresponding authorization for authorization object C_CREX_WRK.

For more information on authorizations, see the Implementation Guide (IMG) for *Process Management*.

Transfer of General Characteristic Data to the Control System

Characteristics and their values are transferred in the control recipe as described above. Additional information on the characteristics, such as input template and format, are not transferred in the control recipe.

If, for example, the control system is to display characteristic values or propose them for input, the control system requires this additional information to process the characteristics correctly.

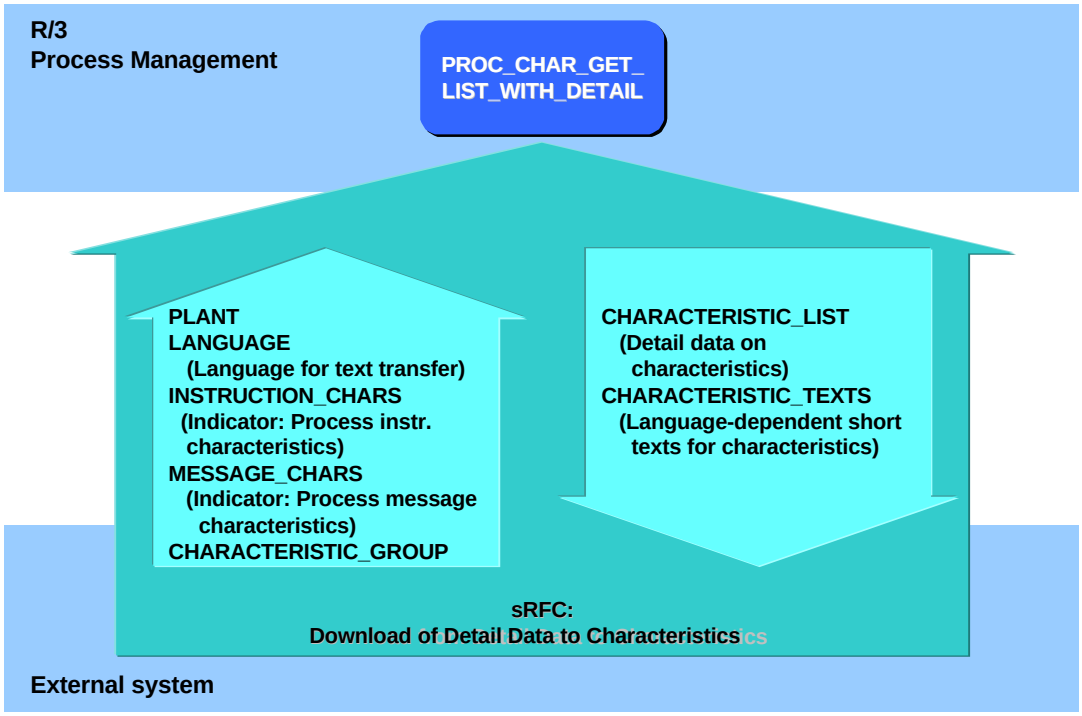
For this reason, you can use the PI-PCS interface to transfer the following general characteristic data to the control system alongside the control recipe:

- Detail data on process message or process instruction characteristics, such as format and characteristic group
- Allowed input values of process instruction or process message characteristics (similar to the possible entries function in the R/3 System)

This data is stored in the characteristic definition in Customizing for *Process Management*.

Download of Detail Data on Characteristics

You can use function module PROC_CHAR_GET_LIST_WITH_DETAIL to transfer detail data on process instruction and process message characteristics to a control system. The download is initiated by the control system. The data is downloaded as a synchronous RFC (see graphic).



The following data is transferred at the interface (from the function module's point of view):

Import Parameters:

Name	Format	Length	Description
PLANT	CHAR	4	Plant
LANGUAGE	LANG	1	Language used to transfer language-dependent char. texts
INSTRUCTION_CHARS	CHAR	1	Indicator: Detail data on process instruction characteristics requested
MESSAGE_CHARS	CHAR	1	Indicator: Detail data on process message characteristics requested
CHARACTERISTIC_ GROUP	CHAR	10	Characteristic group for which detail characteristic data is required. If no value is specified, the system transfers detail data for all

			characteristic groups.

Tables:

Name	Description
CHARACTERISTIC_LIST	Detail data on all selected characteristics
CHARACTERISTIC_TEXTS	Language-dependent short texts for all selected characteristics

Exceptions:

Name	Description
CHARACTERISTIC_GROUP_NOT_VALID	The characteristic group transferred does not exist.
NO_AUTHORITY	No authorization to display characteristic data.

Explanation of the Interface Parameters

Table Structures

CHARACTERISTIC_LIST:

Field	Format	Length	Description
ATNAM	CHAR	30	Characteristic name
ATFOR	CHAR	4	Data type of the characteristic
ANZST	INT2	5	Number of characters
ANZDZ	INT2	5	Number of decimal places
ATVOR	CHAR	1	Indicator: Negative values allowed
ATSCH	CHAR	30	Input template
ATKLE	CHAR	1	Indicator: Case sensitive
ATDIM	INT2	5	Exponent in display
ATDEX	NUMC	1	Exponent display format
ATKLA	CHAR	10	Characteristic group
TXTRF	CHAR	1	Indicator: Characteristic value is long text

CHARACTERISTIC_TEXTS:

Field	Format	Length	Description
ATNAM	CHAR	30	Characteristic name
SPRAS	LANG	1	Language key
ATBEZ	CHAR	30	Characteristic description
ATUE1	CHAR	30	First line of heading
ATUE2	CHAR	30	Second line of heading

Download of Allowed Values for Characteristics

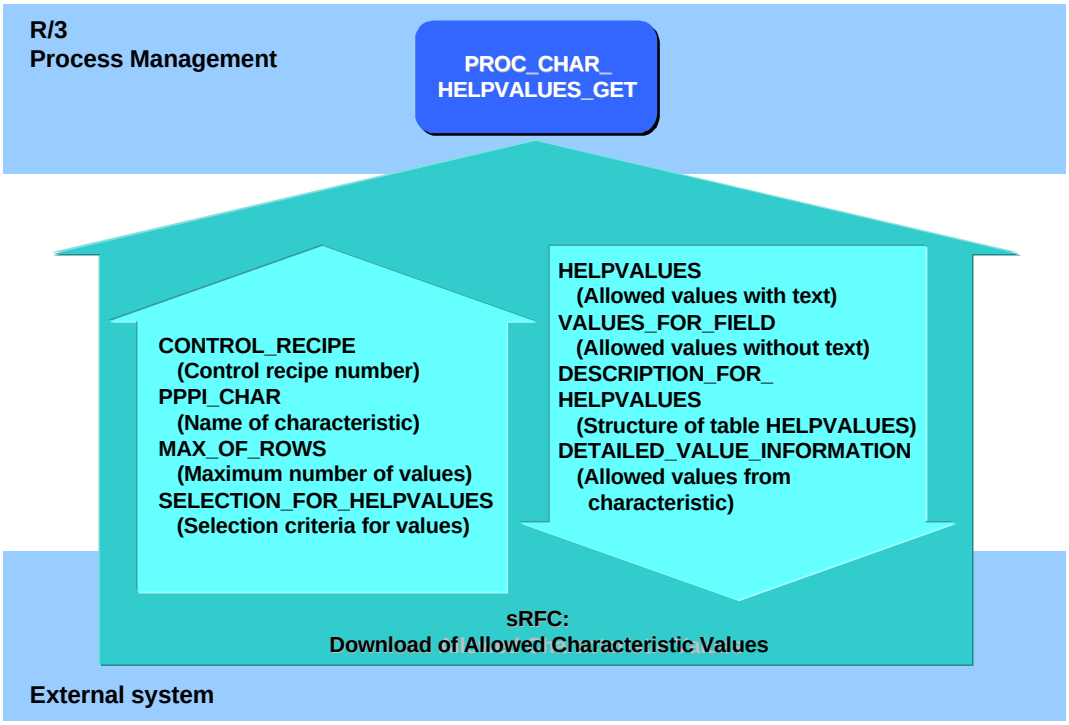
You can use function module PROC_CHAR_HELPVALUES_GET to transfer allowed values for a characteristic to a control system. The download of characteristic values is initiated by the control system. The data is downloaded as a synchronous RFC (see graphic).

The characteristic values are determined based on the following settings made for the characteristic:

- Allowed individual values and value ranges
- The check table or function allocated to it
- The foreign key dependency allocated to it

Matchcodes assigned to a characteristic are not taken into account.

In addition, you can use this function module to check the validity of a single characteristic value. In this case, the control system transfers the value to be checked as a selection criterion. The value is valid if the function module returns the same value in the results table.



The following data is transferred at the interface (from the function module's point of view):

Import Parameters:

Name	Format	Length	Description
CONTROL_RECIPE	NUMC	18	Number of the control recipe that is being processed
PPPI_CHAR	CHAR	30	Name of the characteristic for which the allowed values are requested
MAX_OF_ROWS	INT4	10	Maximum number of values to be selected

Tables:

Name	Description
SELECTION_FOR_HELPVALUES	Selection criteria restricting the search range (Not taken into account if individual values or value ranges have been defined in the characteristic itself.)
HELPVALUES	Allowed values found, text included
VALUES_FOR_FIELD	Allowed values found, text not included
DESCRIPTION_FOR_HELPVALUES	Structure description of table

Name	Description
	HELPVALUES
DETAILED_VALUE_INFORMATION	Detail information on allowed values defined as individual values or value ranges in the characteristic itself

Exceptions:

Name	Description
CHARACTERISTIC_NOT_VALID	Characteristic not valid
VALUES_CAN_NOT_BE_ DETERMINED	Unable to determine allowed values
NO_AUTHORITY	No authorization to display characteristic data
CONTROL_RECIPE_NOT_VALID	Control recipe not valid

Explanation of the Interface Parameters

Table SELECTION_FOR_HELPVALUES:

The control system fills this table if you want to restrict the value range that is used to select allowed values. The table is structured as follows:

Field	Format	Length	Description
SHLPNAME	CHAR	30	Name of search help
SHLPFIELD	CHAR	30	Name of search help parameter
SIGN	CHAR	1	Indicator: I/E (Include/Exclude values)
OPTION	CHAR	2	Selection option, e.g. EQ/BT/CP/... (see documentation on ABAP)
LOW	CHAR	45	Lower interval limit or individual value
HIGH	CHAR	45	Upper interval limit

Table HELPVALUES:

PP-PI uses this table to transfer characteristic values that are **not** defined as individual values or value ranges in the characteristic itself but have been determined using the check table or function, or the foreign key dependency allocated there. It also transfers additional information on the values, such as language-dependent short texts.

Note

If a matchcode has been assigned to the characteristic, this is not taken into account when determining allowed values.

Table HELPVALUES has no fixed structure as the information transferred may vary from characteristic to characteristic and search help to search help. For this reason, the table structure is transferred dynamically in table DESCRIPTION_FOR_HELPVALUES.

Field	Format	Length	Description
HELPVALUES	CHAR	255	Characteristic values found, texts included (value table without structure)

Table VALUES_FOR_FIELD

This table contains the same characteristic values as table HELPVALUES without the additional information. Therefore, the table structure only consists of the field for the characteristic value.

For performance reasons, this table should be used since characteristic values are accessed without defining the structure.

Field	Format	Length	Description
VALUES	CHAR	255	Characteristic values found, texts not included (value table without structure)

Table DESCRIPTION_FOR_HELPVALUES

This table describes the structure of entries in table HELPVALUES. The structure of table HELPVALUES is transferred dynamically as the information transferred varies from characteristic to characteristic and search help to search help.

Table DESCRIPTION_FOR_HELPVALUES comprises the following fields:

Field	Format	Length	Description
TABNAME	CHAR	30	Table name
FIELDNAME	CHAR	30	Field name
LANGU	LANG	1	Language key
POSITION	NUMC	4	Field position in the table
OFFSET	NUMC	6	Field offset in work area

Field	Format	Length	Description
LENG	NUMC	6	Field length (number of characters)
FIELDTEXT	CHAR	60	Short description of Repository objects
REPTEXT	CHAR	55	Heading
SCRTEXT_S	CHAR	10	Short keyword
SCRTEXT_M	CHAR	20	Medium keyword
SCRTEXT_L	CHAR	40	Long keyword

Table DETAILED_VALUE_INFORMATION

PP-PI uses this table to transfer allowed values that have been defined in the characteristic itself (as individual values or values ranges). The table is structured as follows:

Field	Format	Length	Description
OPER1	CHAR	10	Operator for lower limiting value
OPER2	CHAR	10	Operator for upper limiting value
STRING1	CHAR	30	Lower limiting value
STRING2	CHAR	30	Upper limiting value
STRING	CHAR	30	Allowed input value for characteristics without interval definition
ATSTD	CHAR	1	Indicator: Relevant value is to be displayed as default value.

Authorization Check During Characteristic Data Transfer

Before transferring characteristic data to a control system, the R/3 System checks the authorizations of the R/3 user with which the control system requests data. The following authorizations must have been assigned to the user:

- To transfer detail data on characteristics

  Display authorization for object C_CABN
- To transfer allowed characteristic values and validate characteristic values

  Authorization for authorization object C_PROCCHAR as well as the relevant authorization for authorization object C_CREX_WRK

For more information on authorizations, see the Implementation Guide (IMG) for *Process Management*.

Transfer of Process Messages from Control Systems to R/3 PP-PI

Using an RFC, any number of process messages can be transferred from the control system to PP-PI. To transfer messages, call the PP-PI function module PROCESS_MESS_UPLOAD. Transfer is always initiated by the control system.

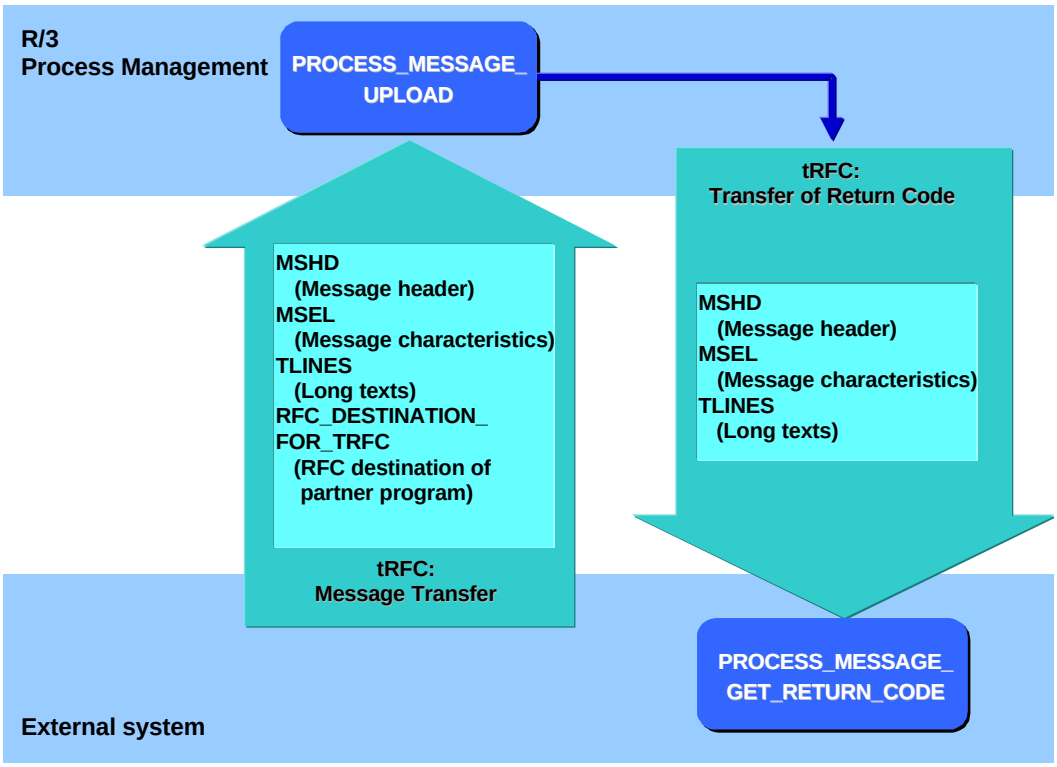
Several messages can be transferred simultaneously via the interface. In order to reduce the system load, a control system should be capable of collecting process messages and transferring them in groups at reasonable time intervals.

As of Release 4.0A, the process messages can be uploaded using a transactional RFC (tRFC). This type of message upload also is the prerequisite for certification as of Release 4.0A. However, message upload using a synchronous RFC (sRFC) is still supported for existing links to control systems.

For this reason, the message transfer process varies as follows:

- In an sRFC, the results of message processing are returned to the control system in the same function call. To do so, the RCODE field of interface tables MSHID and MSEL is used.
- In a tRFC, the control system must also transfer the RFC destination of the RFC partner program as an additional parameter to PP-PI. Function module PROCESS_MESS_UPLOAD runs asynchronously to the call.

  PP-PI then initiates a tRFC to the RFC destination of the RFC partner program to transfer the processing results. To do so, it calls function module PROCESS_MESS_GET_RETURN_CODE and transfers interface tables MSHD and MSEL to the control system (see graphic).



Interface Parameters of PROCESS_MESS_UPLOAD

The following data is exchanged via the RFC interface (from the point of view of PP-PI):

Import Parameters:

Name	Format	Length	Description
RFC_DESTINATION_FOR_TRFC	CHAR	32	RFC destination of the RFC partner program to which the results of message processing are transferred (required for tRFC only)

Tables:

Name	Description	No. of entries
MSHD	Message header	1/message
MSEL	Message characteristics	min. 1/message
TLINES	Text lines for characteristics	

Exceptions:

Name	Description
INTERNAL_ERROR	Internal error in the R/3 System
NO_RFC_DESTINATION	Parameter RFC_DESTINATION_ FOR_TRFC contains no value although the function call was carried out using tRFC

Interface Parameters of PROCESS_MESS_GET_RETURN_CODE

With the following exceptions, the interface of function module PROCESS_MESS_GET_RETURN_CODE is identical to that of PROCESS_MESS_UPLOAD:

- It does **not** contain import parameter RFC_DESTINATION_FOR_TRFC.
- It does **not** contain exception NO_RFC_DESTINATION.

Explanation of the Interface Parameters

Table Structures

Table MSHD:

Field	Format	Length	Description
MSID	CHAR	18	Message number

Field	Format	Length	Description
WERK	CHAR	04	Plant
MSCLA	CHAR	08	Process message category
TSTKZ	CHAR	01	Test indicator
SEDAT	DATS	08	Send date
SEUZT	TIMS	06	Send time
SOURCE	CHAR	32	Sender
RCODE	CHAR	02	Return code

Table MSEL:

Field	Format	Length	Description
MSID	CHAR	18	Message number
ATNAM	CHAR	30	Characteristic name
ATWRT	CHAR	30	Characteristic value
ATFOR	CHAR	04	Characteristic format
RCODE	CHAR	02	Return code

Table MSEL contains the process message characteristics and their values. The characteristic value is always transferred as left-justified in the 30-CHAR field ATWRT. With characteristic format NUM, ATWRT contains the characteristic value in floating-point format.

Table TLINES:

Field	Format	Length	Description
MSID	CHAR	18	Message number
ATNAM	CHAR	30	Characteristic name
TDFORMAT	CHAR	02	Format column for text processing in SAPscript editor
TDLINE	CHAR	132	Text line

Transferring a text for a characteristic is useful only if the characteristic has been defined in PP-PI as a characteristic with a long text.

Explanation of Individual Fields

MSID

Message number. The message number groups the table entries that belong to one process message. The number assigned to a message must be unique within the corresponding RFC.

WERK

Plant to which the message refers

MSCLA

Message category. Each process message must be assigned to one process message category defined in PP-PI (see section *Process Messages and Process Message Categories*).

TSTKZ

Test indicator:

Allowed values	**Meaning**
X	Test mode
SPACE	Normal mode

If the test indicator is set for a process message, this process message is displayed in the PP-PI message monitor. However, it is not processed or sent.

RCODE

Return code for a message header or a message characteristic (see section *Error Handling*)

ATNAM

Identification of a characteristic

ATWRT

Characteristic value

ATFOR

Characteristic format:

Allowed values	**Meaning**
CHAR	Character
NUM	Numeric *
DATE	Date (YYYYMMDD)
TIME	Time (HHMMSS)

* Value is stored as a floating-point value in the field ATWRT

TDLINE

Text line. Any number of text lines can be stored in table TLINES for a characteristic of a process instruction of type "process parameter".

Authorization Check During Process Message Upload

Before transferring process messages from a control system, the R/3 System checks the authorizations of the R/3 user with which the control system transfers messages. The user requires the authorization for process message creation in authorization object C_MESS_WRK. Otherwise, the process messages are rejected.

For more information on authorizations, see the Implementation Guide (IMG) for *Process Management*.

Error Handling

Message Header

If a process message cannot be processed correctly by PROCESS_MESS_UPLOAD, the return code for this message is set to a value not equal to 0 (field RCODE in table MSHD).

Return codes at message header level:

Return code	Meaning
0	Message processed correctly.
1	Plant does not exist (field WERK in table MSHD).
2	Message category not created in the plant (field MSCLA in table MSHD).
3	Invalid test indicator (field TSTKZ in table MSHD).
4	No authorization to create process messages in the specified plant.
99	Message could not be processed due to an error in the corresponding characteristic. (see section on error handling at characteristic level below).

Message Characteristics

If inconsistencies or errors are discovered when the message characteristics are checked, the return code of the corresponding characteristic is set to a value not equal to 0 (field RCODE in table MSEL).

Return codes at message characteristic level:

Return code	Meaning
0	No errors discovered during characteristic check.
1	Characteristic is not created (field ATNAM).
2	Invalid characteristic format (field ATFOR).
3	According to the characteristic definition in PP-PI, the characteristic value should be a long text. However, the table TLINES does not contain a corresponding entry.
4	No value assigned to characteristic. This is not allowed according to the characteristic definition within PP-PI.
5	The corresponding characteristic is used in the message more than once.

If one of the errors listed above occurs, the corresponding process message cannot be processed. The return code at message header level is set to 99.

Internal Errors

If errors occur during message processing that are not due to faulty or inconsistent interface data, exception INTERNAL_ERROR is triggered. In this case, none of the process messages transferred are processed.

Processing of Transactional RFC

If the control system does not transfer an RFC destination to PP-PI in a transactional message upload (parameter RFC_DESTINATION_FOR_TRFC), the results of message processing cannot be transferred to the control system. In this case, PP-PI raises exception NO_RFC_DESTINATION. The system does not process the process messages transferred.

Transfer of Process Messages from R/3 PP-PI to Control System

Using function PROCESS_MESS_DOWNLOAD, any number of process messages can be transferred from PP-PI to the control system. The transfer is always initiated by PP-PI.

Interface Parameters

The following data is exchanged via the RFC interface (from the point of view of PP-PI):

Export Parameters:

Name	Format	Length	Description
CLIENT	CLNT	03	SAP client from the source RFC

Table Parameters:

Name	Description	Entries
MSHD	Message header	1/message
MSEL	Message characteristics	min. 1/message
TLINES	Text lines for characteristics	

Table Structures

See section *Process Messages from the Control System to R/3 PP-PI*

Explanation of Individual Fields

See section *Process Messages from the Control System to R/3 PP-PI*

Appendix: PI-PCS Sample Recipe

To give you an idea of how the interface can be designed, SAP has created a sample recipe for you. The sample recipe only uses process instructions and characteristics that are defined in the SAP reference client and are therefore available in all customer systems. You will find the sample recipe as recipe 5 in recipe group COLORS both in the certification system and the IDES system.

In the following sections, you will find:

- Notes on the process instructions used in the sample recipe
- A print-out of the process instructions and their characteristic values for process order Y-300/PCS1 that has been created using the sample recipe
- The corresponding control recipe as interface tables CRHE, CRFT, and CRFV
- The process message categories and process instruction categories and their characteristics used in the sample recipe
- Process message and process instruction characteristics defined by SAP

Notes on the Sample Recipe

Recipe 5 in recipe group COLORS describes the process required to produce paint Y-300. A total of 13 ingredients are used during various process phases to produce both:

- Y-300: yellow paint in cans
- P-300: paste.

Some of these ingredients serve as catalysts. During later processing steps, they are recorded as output materials with negative quantities (see 300-160 catalyst 01).

The production process itself consists of 4 operations each comprising several phases. The process is controlled by a single control system (control recipe destination 02). This means that only one control recipe has to be created.

The process instructions are arranged in such a way that the control recipe consists of a general first part that applies to the whole process. This general part contains information such as:

- General order data
- A list of all materials
- Process message subscriptions for process messages that are to be transferred to PP-PI during the production process

The general part is followed by a second part that contains process instructions specific to phases such as:

- Parameters for individual phases
- Requirements for specific measurement readings.

Process Instructions - General Part

Control recipe destination 02 is configured in such a way that the process instructions contained in the general part are generated automatically under process instruction number 0000 in the first phase (1010) when you create the control recipe.

The general part contains process instructions of the following categories:

- AORD_1 (type 1 - process parameter)

  This process instruction provides order-related data not contained in the header of the control system (interface table CRHD) such as order quantity, resource network, and the plant in which the resource network is located.

- AMAT_1 (type 1 - process parameter)

  Process instructions of category AMAT_1 are used to transfer information on materials employed during the production process. One process instruction of category AMAT_1 is generated per material. As the material list contains 17 ingredients, the sample recipe thus contains 17 process instructions of category AMAT_1.

- ACRST_I (type 3 - process message subscription)

  This process instruction specifies that a process message of category PI_CRST is to be transferred to PP-PI whenever the status of the control recipe changes. You can also specify the characteristics that are to constitute the message.

  Characteristics PPPI_PROCESS_ORDER and PPPI_CONTROL_RECIPE already contain values, and can be sent directly to the message. All other characteristics of the process message to be transferred are assigned as values to the process instruction characteristic PPPI_REQUESTED_VALUE. Their value has to be assigned by the control system and must also be included in the message.

- AOPST_I (type 3 - process message subscription)

  This process instruction specifies that a process message of category PI_OPST is to be transferred to PP-PI whenever the status of an operation changes. It also specifies the characteristics that are to constitute this message . The message characteristic PPPI_PROCESS_ORDER contains a value already, and can be directly transferred to the message. All other characteristics of the process message to be transferred are assigned as values to the process instruction characteristic PPPI_REQUESTED_VALUE. Their values must be assigned by the control system, and must also be included in the message.

- APHST_I (type 3 - process message subscription)

  This process instruction specifies that a process message of category PI_PHST is to be transferred to PP-PI whenever the status of a phase changes. It also specifies the characteristics that are to constitute this message (see also notes on AOPST_I in the previous section).

- APROD_1 (type 3 - process message subscription)

  This process instruction specifies that a process message of category PI_PROD is to be transferred to PP-PI when a material is produced. It also specifies the characteristics that are to constitute this message (see also notes in sections AOPST_I).

- ACONS_1 (type 3 - process message subscription)
  This process instruction specifies that a process message of category PI_CONS is to be transferred to PP-PI when a material is consumed. It also specifies the characteristics that are to constitute this message (see also notes in sections AOPST_I).

Process Instructions - Phases

Control recipe destination 02 has been configured in such a way that a process instruction of category APHASE_1 (type 1 - process parameter) with number 0000 is generated for each phase when you create a control recipe.

Process instruction APHASE_1 contains the following phase-related information:

- Number of the superior operation
- Primary resource that is to be used to execute the phase
- Plant in which the primary resource is located (identical to the plant of the order)
- Short text for the phase
- Description or identification of the phase in the control system

Apart from process parameter APHASE_1 created for each phase, further process instructions are allocated to some phases contained in the sample recipe.

- APHAR_1 (type 1 - process parameter)

  Process instruction APHAR_1 is used to transfer control-relevant parameters to the control system. It consists of:
  - Phase number
  - Parameter name
  - Parameter value
  - Lower or upper limit of the setpoint (if required)
  - Unit of measure (if required)

  In the APHAR_1 instruction for phase 1020 (analyze and adjust), for instance, a stirring period of 15 minutes is specified for the stirring action.

  For phases 2010 (prepare reaction basic substances) and 2030 (reaction), the relevant pH value is adjusted in line with the upper and lower limit; in phase 4010 (drying), the drying temperature is adjusted in line with its permissible tolerances.

- AREAD1 (type 2 - process data request)

  Process instruction AREAD1 is used to request a measurement reading or the value of a data point defined in the control system. The value is to be transferred as process message DPREAD to PP-PI. The values of the following message characteristics are

already defined in the process instruction and can therefore be transferred directly to the process message:

- PPPI_PROCESS_ORDER
- PPPI_DATA_POINT_NAME
- PPPI_UNIT_OF_MEASURE
- PPPI_OPERATION
- PPPI_PHASE

All other characteristics of the process message to be created are assigned as values to process instruction characteristic PPPI_REQUESTED_VALUE. Their value must be assigned by the control system and must be included in the message.

A process instruction of category AREAD1 that requests the result of a density measurement is contained in phase 1030 (Transfer to reactor unit). In phases 2010 (prepare reaction basic substances) and 2030 (reaction), the pH values at the end of these phases are requested.

Print-Out of the Process Order

Process order : Y-300/PCS1 **Date:** 02/02/1996
Plant : 1100 **Time:** 15:50
Description : Master Recipe for Paints (PCS)
Material : Y-300
Mat. description : Yellow Paint in Cans

Operation: 1000 Charging and dissolving **Resource:** R_1111

Phase: 1010 Charge input substances

PI no.	Process inst. cat.	Description
0000	AORD_1	Order Data

PIC no.	Characteristic	Char. value
0010	PPPI_ORDER_QUANTITY	10,000.000
0020	PPPI_RESOURCE_NETWORK	R_1190
0030	PPPI_PLANT_OF_RESOURCE	1100

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-110
0020	PPPI_MATERIAL_ITEM	0010
0030	PPPI_MATERIAL_SHORT_TEXT	Water
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	1674.000
0070	PPPI_UNIT_OF_MEASURE	L

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-120
0020	PPPI_MATERIAL_ITEM	0020
0030	PPPI_MATERIAL_SHORT_TEX	Diaminobenzene
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	2326.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-130
0020	PPPI_MATERIAL_ITEM	0050
0030	PPPI_MATERIAL_SHORT_TEXT	Pyridine CDE
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	1530.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-140
0020	PPPI_MATERIAL_ITEM	0060
0030	PPPI_MATERIAL_SHORT_TEXT	Hydrochloric Acid

0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	2300.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	**Process inst. cat.**	**Description**
0000	AMAT_1	Material allocation

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_MATERIAL	300-150
0020	PPPI_MATERIAL_ITEM	0070
0030	PPPI_MATERIAL_SHORT_TEXT	Sodium hydrogen carbonate
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	806.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	**Process inst. cat.**	**Description**
0000	AMAT_1	Material allocation

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_MATERIAL	300-160
0020	PPPI_MATERIAL_ITEM	0080
0030	PPPI_MATERIAL_SHORT_TEXT	CAT_01 Catalyst 01
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	100.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-160
0020	PPPI_MATERIAL_ITEM	0090
0030	PPPI_MATERIAL_SHORT_TEXT CAT_01	Catalyst 01
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	80.000-
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-170
0020	PPPI_MATERIAL_ITEM	0120
0030	PPPI_MATERIAL_SHORT_TEXT	Diamino Toluene
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	1100.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-180
0020	PPPI_MATERIAL_ITEM	0130
0030	PPPI_MATERIAL_SHORT_TEXT	Sodium Nitrate

0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	534.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	**Process inst. cat.**	**Description**
0000	AMAT_1	Material allocation

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_MATERIAL	300-190
0020	PPPI_MATERIAL_ITEM	0140
0030	PPPI_MATERIAL_SHORT_TEXT	Silcolapse
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	24.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	**Process inst. cat.**	**Description**
0000	AMAT_1	Material allocation

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_MATERIAL	300-200
0020	PPPI_MATERIAL_ITEM	0150
0030	PPPI_MATERIAL_SHORT_TEXT	Sulphuric Acid
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	16.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-210
0020	PPPI_MATERIAL_ITEM	0160
0030	PPPI_MATERIAL_SHORT_TEXT	Cyanuric Chloride
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	1674.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	Y-300
0020	PPPI_MATERIAL_ITEM	0000
0030	PPPI_MATERIAL_SHORT_TEXT	Yellow Paint in Cans
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	10000.000-
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	P-300
0020	PPPI_MATERIAL_ITEM	0165
0030	PPPI_MATERIAL_SHORT_TEXT	Paste

0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	1000.000-
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	**Process inst. cat.**	**Description**
0000	AMAT_1	Material allocation

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_MATERIAL	300-220
0020	PPPI_MATERIAL_ITEM	0170
0030	PPPI_MATERIAL_SHORT_TEXT	Sodium carbonate
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	1250.000
0070	PPPI_UNIT_OF_MEASURE	KG

PI no.	**Process inst. cat.**	**Description**
0000	AMAT_1	Material allocation

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_MATERIAL	300-230
0020	PPPI_MATERIAL_ITEM	0180
0030	PPPI_MATERIAL_SHORT_TEXT	Contaminated Water
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	200.000-
0070	PPPI_UNIT_OF_MEASURE	L

PI no.	Process inst. cat.	Description
0000	AMAT_1	Material allocation

PIC no.	Characteristic	Char. value
0010	PPPI_MATERIAL	300-240
0020	PPPI_MATERIAL_ITEM	0190
0030	PPPI_MATERIAL_SHORT_TEXT	Cans
0040	PPPI_OPERATION	1000
0050	PPPI_PHASE	1010
0060	PPPI_MATERIAL_QUANTITY	120.000
0070	PPPI_UNIT_OF_MEASURE	ST

PI no.	Process inst. cat.	Description
0000	ACRST_I	Change ctrl. recipe status (PCS example)

PIC no.	Characteristic	Char. value
0020	PPPI_MESSAGE_CATEGORY	PI_CRST
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_CONTROL_RECIPE	
0050	PPPI_REQUESTED_VALUE	PPPI_CONTROL_RECIPE_STATUS
0060	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME

PI no.	Process inst. cat.	Description
0000	AOPST_I	Change operation status (PCS example)

PIC no.	Characteristic	Char. value
0020	PPPI_MESSAGE_CATEGORY	PI_OPST
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_REQUESTED_VALUE	PPPI_OPERATION
0050	PPPI_REQUESTED_VALUE	PPPI_OPERATION_STATUS

0060	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME

PI no.	**Process inst. cat.**	**Description**
0000	APHST_I	Change phase status (PCS example)

PIC no.	**Characteristic**	**Char. value**
0020	PPPI_MESSAGE_CATEGORY	PI_PHST
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_REQUESTED_VALUE	PPPI_OPERATION
0050	PPPI_REQUESTED_VALUE	PPPI_PHASE
0060	PPPI_REQUESTED_VALUE	PPPI_PHASE_STATUS
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0080	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME

PI no.	**Process inst. cat.**	**Description**
0000	APROD_1	Goods receipt (PCS interface example)

PIC no.	**Characteristic**	**Char. value**
0020	PPPI_MESSAGE_CATEGORY	PI_PROD
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_REQUESTED_VALUE	PPPI_OPERATION
0050	PPPI_REQUESTED_VALUE	PPPI_PHASE
0060	PPPI_REQUESTED_VALUE	PPPI_MATERIAL
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0080	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0090	PPPI_REQUESTED_VALUE	PPPI_MATERIAL_PRODUCED
0100	PPPI_REQUESTED_VALUE	PPPI_UNIT_OF_MEASURE

PI no.	Process inst. cat.	Description
0000	ACONS_1	Goods issue (PCS interface example)

PIC no.	Characteristic	Char. value
0020	PPPI_MESSAGE_CATEGORY	PI_CONS
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_REQUESTED_VALUE	PPPI_OPERATION
0050	PPPI_REQUESTED_VALUE	PPPI_PHASE
0060	PPPI_REQUESTED_VALUE	PPPI_MATERIAL
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0080	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0090	PPPI_REQUESTED_VALUE	PPPI_MATERIAL_CONSUMED
0100	PPPI_REQUESTED_VALUE	PPPI_UNIT_OF_MEASURE

PI no.	Process inst. cat.	Description
0000	APHASE_1	Phase list

PIC no.	Characteristic	Char. value
0010	PPPI_PHASE	1010
0020	PPPI_OPERATION	1000
0030	PPPI_PHASE_RESOURCE	R_1111
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Charge input substances
0050	PPPI_EXTERNAL_PHASE	CHARGE1

Phase: 1020 Analyze and adjust

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	1020
0020	PPPI_OPERATION	1000
0030	PPPI_PHASE_RESOURCE	R_1111
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Analyze and adjust
0050	PPPI_EXTERNAL_PHASE	ADJUST1

PI no.	**Process inst. cat.**	**Description**
0010	APHPAR_1	Phase parameter

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	1020
0020	PPPI_PARAMETER_NAME	MIX_TIME
0030	PPPI_PARAMETER_VALUE	15.000
0040	PPPI_UNIT_OF_MEASURE	MIN

Phase: 1030 Transfer to reactor unit

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	1030
0020	PPPI_OPERATION	1000
0030	PPPI_PHASE_RESOURCE	R_1111
0040	PPPI_PLANT_OF_RESOURCE	1100

0045	PPPI_PHASE_SHORT_TEXT	Transfer to reactor unit
0050	PPPI_EXTERNAL_PHASE	TRANSFER1

PI no.	**Process inst. cat.**	**Description**
0010	AREAD1	Requesting density

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_DATA_REQUEST_TYPE	SIMPLE
0020	PPPI_MESSAGE_CATEGORY	DPREAD
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_DATA_POINT_NAME	DENSITY_READ
0060	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0080	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0090	PPPI_UNIT_OF_MEASURE	KG/M3
0100	PPPI_OPERATION	1000
0110	PPPI_PHASE	1030

Operation: 2000 Reaction **Resource:** R_1121

Phase: 2010 Prepare reaction basic substances

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	2010
0020	PPPI_OPERATION	2000
0030	PPPI_PHASE_RESOURCE	R_1121
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Prepare reaction basic substance
0050	PPPI_EXTERNAL_PHASE	PREPARE1

PI no.	**Process inst. cat.**	**Description**
0010	APHPAR_1	Phase parameter

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	2010
0020	PPPI_PARAMETER_NAME	PH_VALUE
0030	PPPI_PARAMETER_VALUE	6,500
0031	PPPI_PARAMETER_VALUE_MIN	6,000
0032	PPPI_PARAMETER_VALUE_MAX	7,000

PI no.	**Process inst. cat.**	**Description**
0020	AREAD1	Requesting a pH value

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_DATA_REQUEST_TYPE	SIMPLE
0020	PPPI_MESSAGE_CATEGORY	DPREAD
0030	PPPI_PROCESS_ORDER	Y-300/PCS1

0040	PPPI_DATA_POINT_NAME	PH1_END_OF_PHASE
0060	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0075	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0080	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0090	PPPI_UNIT_OF_MEASURE	
0100	PPPI_OPERATION	2000
0110	PPPI_PHASE	2010

Phase: 2020 Add mixture from operation 1000

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	2020
0020	PPPI_OPERATION	2000
0030	PPPI_PHASE_RESOURCE	R_1121
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Add mixture from operation 100
0050	PPPI_EXTERNAL_PHASE	CHARGE2

Phase: 2030 Reaction takes place!

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	2030
0020	PPPI_OPERATION	2000
0030	PPPI_PHASE_RESOURCE	R_1121
0040	PPPI_PLANT_OF_RESOURCE	1100

0045	PPPI_PHASE_SHORT_TEXT	Reaction takes place!
0050	PPPI_EXTERNAL_PHASE	REACTION1

PI no.	**Process inst. cat.**	**Description**
0010	APHPAR_1	Phase parameter
PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	2030
0020	PPPI_PARAMETER_NAME	PH_VALUE
0030	PPPI_PARAMETER_VALUE	6.500
0031	PPPI_PARAMETER_VALUE_MIN	6.000
0032	PPPI_PARAMETER_VALUE_MAX	7.000

PI no.	**Process inst. cat.**	**Description**
0020	AREAD1	Requesting final pH value
PIC no.	**Characteristic**	**Char. value**
0010	PPPI_DATA_REQUEST_TYPE	SIMPLE
0020	PPPI_MESSAGE_CATEGORY	DPREAD
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_DATA_POINT_NAME	PH1_END_OF_PHASE
0060	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE
0070	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0075	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0080	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0090	PPPI_UNIT_OF_MEASURE	
0100	PPPI_OPERATION	2000
0110	PPPI_PHASE	2030

Phase: 2040 Discharge to condensation unit

PI no.	Process inst. cat.	Description
0000	APHASE_1	Phase list

PIC no.	Characteristic	Char. value
0010	PPPI_PHASE	2040
0020	PPPI_OPERATION	2000
0030	PPPI_PHASE_RESOURCE	R_1121
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Discharge to condensation unit
0050	PPPI_EXTERNAL_PHASE	DISCHARGE1

Operation: 3000 Diazotise and couple **Resource**: R_1131

Phase: 3010 Receive mixture from operation 2000

PI no.	Process inst. cat.	Description
0000	APHASE_1	Phase list

PIC no.	Characteristic	Char. value
0010	PPPI_PHASE	3010
0020	PPPI_OPERATION	3000
0030	PPPI_PHASE_RESOURCE	R_1131
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Receive mixture from operation
0050	PPPI_EXTERNAL_PHASE	CHARGE2

Phase: 3020 Heating operation

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	3020
0020	PPPI_OPERATION	3000
0030	PPPI_PHASE_RESOURCE	R_1131
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Heating operation
0050	PPPI_EXTERNAL_PHASE	HEAT1

PI no.	**Process inst. cat.**	**Description**
0010	AREAD2	Repeated temperature readings

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_DATA_REQUEST_TYPE	REPEATED
0020	PPPI_MESSAGE_CATEGORY	DPREAD
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0041	PPPI_DATA_POINT_NAME	TEMP_1
0050	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE
0060	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0080	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME
0090	PPPI_UNIT_OF_MEASURE	C
0100	PPPI_OPERATION	3000
0110	PPPI_PHASE	3020

Phase: 3030 Condensing operation

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	3030
0020	PPPI_OPERATION	3000
0030	PPPI_PHASE_RESOURCE	R_1131
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Condensing operation
0050	PPPI_EXTERNAL_PHASE	CONDENS1

Phase: 3040 Discharge to filter press

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	3040
0020	PPPI_OPERATION	3000
0030	PPPI_PHASE_RESOURCE	R_1131
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Discharge to filter press
0050	PPPI_EXTERNAL_PHASE	DISCHARG1

Operation: 4000 Filter press **Resource:** R_1140

Phase: 4010 Drying operation

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	4010
0020	PPPI_OPERATION	4000
0030	PPPI_PHASE_RESOURCE	R_1140
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Drying operation
0050	PPPI_EXTERNAL_PHASE	DRY1

PI no.	**Process inst. cat.**	**Description**
0010	APHPAR_1	Phase parameter

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	4010
0020	PPPI_PARAMETER_NAME	TEMPERATURE
0030	PPPI_PARAMETER_VALUE	65.000
0031	PPPI_PARAMETER_VALUE_MIN	60.000
0032	PPPI_PARAMETER_VALUE_MAX	70.000
0040	PPPI_UNIT_OF_MEASURE	C

PI no.	Process inst. cat.	Description
0020	AQMSMR_1	Requesting QM results

PIC no.	Characteristic	Char. value
0020	PPPI_MESSAGE_CATEGORY	PI_QMSMR
0030	PPPI_PROCESS_ORDER	Y-300/PCS1
0040	PPPI_OPERATION	4000
0050	PPPI_INSPECTION_LOT	000000000000
0060	PPPI_INSPECTION_CHARACT	10
0070	PPPI_REQUESTED_VALUE	PPPI_NUMBER_OF_INSPECTIONS
0080	PPPI_REQUESTED_VALUE	PPPI_INSPECTION_SHORT_TEXT
0090	PPPI_REQUESTED_VALUE	PPPI_INSPECTION_RESULT
0100	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE
0110	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME

Phase: 4020 Receive mixture from operation 3035

PI no.	Process inst. cat.	Description
0000	APHASE_1	Phase list

PIC no.	Characteristic	Char. value
0010	PPPI_PHASE	4020
0020	PPPI_OPERATION	4000
0030	PPPI_PHASE_RESOURCE	R_1140
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Receive mixture from operation
0050	PPPI_EXTERNAL_PHASE	CHARGE2

Phase: 4030 Discharge to cans

PI no.	**Process inst. cat.**	**Description**
0000	APHASE_1	Phase list

PIC no.	**Characteristic**	**Char. value**
0010	PPPI_PHASE	4030
0020	PPPI_OPERATION	4000
0030		PPPI_PHASE_RESOURCE R_1140
0040	PPPI_PLANT_OF_RESOURCE	1100
0045	PPPI_PHASE_SHORT_TEXT	Discharge to cans
0050	PPPI_EXTERNAL_PHASE	DISCHARG1

Interface Tables of the Control Recipe

Table CRHE, Control Recipe Headers

CRID	WERK	BID	ADRES	TSTKZ	CRSTAT	KTXT	MATNR	MATXT
100000000000000616	1100	Y-300/PCS1	PCS1		00003	Yellow Paint in Cans	Y-300	Yellow Paint in Cans

Table CRFT, Process Instructions

CRID	FTNO	FTTYP	COSTR
100000000000000616	00000460	1	APHASE_1
100000000000000616	00000010	1	AORD_1
100000000000000616	00000020	1	AMAT_1
100000000000000616	00000030	1	AMAT_1
100000000000000616	00000040	1	AMAT_1
100000000000000616	00000050	1	AMAT_1
100000000000000616	00000060	1	AMAT_1
100000000000000616	00000070	1	AMAT_1
100000000000000616	00000080	1	AMAT_1
100000000000000616	00000090	1	AMAT_1
100000000000000616	00000100	1	AMAT_1
100000000000000616	00000110	1	AMAT_1

CRID	FTNO	FTTYP	COSTR
100000000000000616	00000120	1	AMAT_1
100000000000000616	00000130	1	AMAT_1
100000000000000616	00000140	1	AMAT_1
100000000000000616	00000150	1	AMAT_1
100000000000000616	00000160	1	AMAT_1
100000000000000616	00000170	1	AMAT_1
100000000000000616	00000180	1	AMAT_1
100000000000000616	00000190	3	ACRST_I
100000000000000616	00000200	3	AOPST_I
100000000000000616	00000210	3	APHST_I
100000000000000616	00000220	3	APROD_1
100000000000000616	00000230	3	ACONS_1
100000000000000616	00000240	1	APHASE_1
100000000000000616	00000250	1	APHASE_1
100000000000000616	00000260	1	APHPAR_1
100000000000000616	00000270	1	APHASE_1
100000000000000616	00000280	2	AREAD1
100000000000000616	00000290	1	APHASE_1
100000000000000616	00000300	1	APHPAR_1
100000000000000616	00000310	2	AREAD1

CRID	FTNO	FTTYP	COSTR
100000000000000616	00000320	1	APHASE_1
100000000000000616	00000330	1	APHASE_1
100000000000000616	00000340	1	APHPAR_1
100000000000000616	00000350	2	AREAD1
100000000000000616	00000360	1	APHASE_1
100000000000000616	00000370	1	APHASE_1
100000000000000616	00000380	1	APHASE_1
100000000000000616	00000390	2	AREAD2
100000000000000616	00000400	1	APHASE_1
100000000000000616	00000410	1	APHASE_1
100000000000000616	00000420	1	APHASE_1
100000000000000616	00000430	1	APHPAR_1
100000000000000616	00000440	2	AQMSMR_1
100000000000000616	00000450	1	APHASE_1
100000000000000616	00000460	1	APHASE_1

Table CRFV, Process Instruction Characteristics

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000010	0001	PPPI_ORDER_QUANTITY	1.0000000000000000E+04	NUM

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000010	0002	PPPI_RESOURCE_NETWORK	R_1190	CHAR
100000000000000616	00000010	0003	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000020	0001	PPPI_MATERIAL	300-110	CHAR
100000000000000616	00000020	0002	PPPI_MATERIAL_ITEM	0010	CHAR
100000000000000616	00000020	0003	PPPI_MATERIAL_SHORT_TEXT	Water	CHAR
100000000000000616	00000020	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000020	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000020	0006	PPPI_MATERIAL_QUANTITY	1.6740000000000000E+03	NUM
100000000000000616	00000020	0007	PPPI_UNIT_OF_MEASURE	L	CHAR
100000000000000616	00000030	0001	PPPI_MATERIAL	300-120	CHAR
100000000000000616	00000030	0002	PPPI_MATERIAL_ITEM	0020	CHAR
100000000000000616	00000030	0003	PPPI_MATERIAL_SHORT_TEXT	Diaminobenzene	CHAR
100000000000000616	00000030	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000030	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000030	0006	PPPI_MATERIAL_QUANTITY	2.3260000000000000E+03	NUM
100000000000000616	00000030	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000040	0001	PPPI_MATERIAL	300-130	CHAR
100000000000000616	00000040	0002	PPPI_MATERIAL_ITEM	0050	CHAR
100000000000000616	00000040	0003	PPPI_MATERIAL_SHORT_TEXT	Pyridine CDE	CHAR
100000000000000616	00000040	0004	PPPI_OPERATION	1000	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000040	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000040	0006	PPPI_MATERIAL_QUANTITY	1.53000000000000000E+03	NUM
100000000000000616	00000040	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000050	0001	PPPI_MATERIAL	300-140	CHAR
100000000000000616	00000050	0002	PPPI_MATERIAL_ITEM	0060	CHAR
100000000000000616	00000050	0003	PPPI_MATERIAL_SHORT_TEXT	Hydrochloric Acid	CHAR
100000000000000616	00000050	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000050	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000050	0006	PPPI_MATERIAL_QUANTITY	2.30000000000000000E+03	NUM
100000000000000616	00000050	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000060	0001	PPPI_MATERIAL	300-150	CHAR
100000000000000616	00000060	0002	PPPI_MATERIAL_ITEM	0070	CHAR
100000000000000616	00000060	0003	PPPI_MATERIAL_SHORT_TEXT	Sodium hydrogen carbonate	CHAR
100000000000000616	00000060	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000060	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000060	0006	PPPI_MATERIAL_QUANTITY	8.06000000000000000E+02	NUM
100000000000000616	00000060	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000070	0001	PPPI_MATERIAL	300-160	CHAR
100000000000000616	00000070	0002	PPPI_MATERIAL_ITEM	0080	CHAR
100000000000000616	00000070	0003	PPPI_MATERIAL_SHORT_TEXT	CAT_01Catalyst 01	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000070	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000070	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000070	0006	PPPI_MATERIAL_QUANTITY	1.0000000000000000E+02	NUM
100000000000000616	00000070	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000080	0001	PPPI_MATERIAL	300-160	CHAR
100000000000000616	00000080	0002	PPPI_MATERIAL_ITEM	0090	CHAR
100000000000000616	00000080	0003	PPPI_MATERIAL_SHORT_TEXT	CAT_01Catalyst 01	CHAR
100000000000000616	00000080	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000080	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000080	0006	PPPI_MATERIAL_QUANTITY	-8.0000000000000000E+01	NUM
100000000000000616	00000080	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000090	0001	PPPI_MATERIAL	300-170	CHAR
100000000000000616	00000090	0002	PPPI_MATERIAL_ITEM	0120	CHAR
100000000000000616	00000090	0003	PPPI_MATERIAL_SHORT_TEXT	Diamino Toluene	CHAR
100000000000000616	00000090	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000090	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000090	0006	PPPI_MATERIAL_QUANTITY	1.1000000000000000E+03	NUM
100000000000000616	00000090	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000100	0001	PPPI_MATERIAL	300-180	CHAR
100000000000000616	00000100	0002	PPPI_MATERIAL_ITEM	0130	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000100	0003	PPPI_MATERIAL_SHORT_TEXT	Sodium Nitrate	CHAR
100000000000000616	00000100	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000100	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000100	0006	PPPI_MATERIAL_QUANTITY	5.3400000000000000E+02	NUM
100000000000000616	00000100	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000110	0001	PPPI_MATERIAL	300-190	CHAR
100000000000000616	00000110	0002	PPPI_MATERIAL_ITEM	0140	CHAR
100000000000000616	00000110	0003	PPPI_MATERIAL_SHORT_TEXT	Silcolapse	CHAR
100000000000000616	00000110	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000110	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000110	0006	PPPI_MATERIAL_QUANTITY	2.4000000000000000E+01	NUM
100000000000000616	00000110	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000120	0001	PPPI_MATERIAL	300-200	CHAR
100000000000000616	00000120	0002	PPPI_MATERIAL_ITEM	0150	CHAR
100000000000000616	00000120	0003	PPPI_MATERIAL_SHORT_TEXT	Sulphuric Acid	CHAR
100000000000000616	00000120	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000120	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000120	0006	PPPI_MATERIAL_QUANTITY	1.6000000000000000E+01	NUM
100000000000000616	00000120	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000130	0001	PPPI_MATERIAL	300-210	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000130	0002	PPPI_MATERIAL_ITEM	0160	CHAR
100000000000000616	00000130	0003	PPPI_MATERIAL_SHORT_TEXT	Cyanuric Chloride	CHAR
100000000000000616	00000130	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000130	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000130	0006	PPPI_MATERIAL_QUANTITY	1.6740000000000000E+03	NUM
100000000000000616	00000130	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000140	0001	PPPI_MATERIAL	Y-300	CHAR
100000000000000616	00000140	0002	PPPI_MATERIAL_ITEM	0000	CHAR
100000000000000616	00000140	0003	PPPI_MATERIAL_SHORT_TEXT	Yellow Paint in Cans	CHAR
100000000000000616	00000140	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000140	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000140	0006	PPPI_MATERIAL_QUANTITY	-1.0000000000000000E+04	NUM
100000000000000616	00000140	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000150	0001	PPPI_MATERIAL	P-300	CHAR
100000000000000616	00000150	0002	PPPI_MATERIAL_ITEM	0165	CHAR
100000000000000616	00000150	0003	PPPI_MATERIAL_SHORT_TEXT	Paste	CHAR
100000000000000616	00000150	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000150	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000150	0006	PPPI_MATERIAL_QUANTITY	-1.0000000000000000E+03	NUM
100000000000000616	00000150	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000160	0001	PPPI_MATERIAL	300-220	CHAR
100000000000000616	00000160	0002	PPPI_MATERIAL_ITEM	0170	CHAR
100000000000000616	00000160	0003	PPPI_MATERIAL_SHORT_TEXT	Sodium carbonate	CHAR
100000000000000616	00000160	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000160	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000160	0006	PPPI_MATERIAL_QUANTITY	1.2500000000000000E+03	NUM
100000000000000616	00000160	0007	PPPI_UNIT_OF_MEASURE	KG	CHAR
100000000000000616	00000170	0001	PPPI_MATERIAL	300-230	CHAR
100000000000000616	00000170	0002	PPPI_MATERIAL_ITEM	0180	CHAR
100000000000000616	00000170	0003	PPPI_MATERIAL_SHORT_TEXT	Contaminated Water	CHAR
100000000000000616	00000170	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000170	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000170	0006	PPPI_MATERIAL_QUANTITY	-2.0000000000000000E+02	NUM
100000000000000616	00000170	0007	PPPI_UNIT_OF_MEASURE	L	CHAR
100000000000000616	00000180	0001	PPPI_MATERIAL	300-240	CHAR
100000000000000616	00000180	0002	PPPI_MATERIAL_ITEM	0190	CHAR
100000000000000616	00000180	0003	PPPI_MATERIAL_SHORT_TEXT	Cans	CHAR
100000000000000616	00000180	0004	PPPI_OPERATION	1000	CHAR
100000000000000616	00000180	0005	PPPI_PHASE	1010	CHAR
100000000000000616	00000180	0006	PPPI_MATERIAL_QUANTITY	1.2000000000000000E+02	NUM

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000180	0007	PPPI_UNIT_OF_MEASURE	ST	CHAR
100000000000000616	00000190	0001	PPPI_MESSAGE_CATEGORY	PI_CRST	CHAR
100000000000000616	00000190	0002	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000190	0003	PPPI_CONTROL_RECIPE	100000000000000616	CHAR
100000000000000616	00000190	0004	PPPI_REQUESTED_VALUE	PPPI_CONTROL_RECIPE_STATUS	CHAR
100000000000000616	00000190	0005	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000190	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000200	0001	PPPI_MESSAGE_CATEGORY	PI_OPST	CHAR
100000000000000616	00000200	0002	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000200	0003	PPPI_REQUESTED_VALUE	PPPI_OPERATION	CHAR
100000000000000616	00000200	0004	PPPI_REQUESTED_VALUE	PPPI_OPERATION_STATUS	CHAR
100000000000000616	00000200	0005	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000200	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000210	0001	PPPI_MESSAGE_CATEGORY	PI_PHST	CHAR
100000000000000616	00000210	0002	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000210	0003	PPPI_REQUESTED_VALUE	PPPI_OPERATION	CHAR
100000000000000616	00000210	0004	PPPI_REQUESTED_VALUE	PPPI_PHASE	CHAR
100000000000000616	00000210	0005	PPPI_REQUESTED_VALUE	PPPI_PHASE_STATUS	CHAR
100000000000000616	00000210	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000210	0007	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000220	0001	PPPI_MESSAGE_CATEGORY	PI_PROD	CHAR
100000000000000616	00000220	0002	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000220	0003	PPPI_REQUESTED_VALUE	PPPI_OPERATION	CHAR
100000000000000616	00000220	0004	PPPI_REQUESTED_VALUE	PPPI_PHASE	CHAR
100000000000000616	00000220	0005	PPPI_REQUESTED_VALUE	PPPI_MATERIAL	CHAR
100000000000000616	00000220	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000220	0007	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000220	0008	PPPI_REQUESTED_VALUE	PPPI_MATERIAL_PRODUCED	CHAR
100000000000000616	00000220	0009	PPPI_REQUESTED_VALUE	PPPI_UNIT_OF_MEASURE	CHAR
100000000000000616	00000230	0001	PPPI_MESSAGE_CATEGORY	PI_CONS	CHAR
100000000000000616	00000230	0002	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000230	0003	PPPI_REQUESTED_VALUE	PPPI_OPERATION	CHAR
100000000000000616	00000230	0004	PPPI_REQUESTED_VALUE	PPPI_PHASE	CHAR
100000000000000616	00000230	0005	PPPI_REQUESTED_VALUE	PPPI_MATERIAL	CHAR
100000000000000616	00000230	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000230	0007	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000230	0008	PPPI_REQUESTED_VALUE	PPPI_MATERIAL_CONSUMED	CHAR
100000000000000616	00000230	0009	PPPI_REQUESTED_VALUE	PPPI_UNIT_OF_MEASURE	CHAR
100000000000000616	00000240	0001	PPPI_PHASE	1010	CHAR
100000000000000616	00000240	0002	PPPI_OPERATION	1000	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000240	0003	PPPI_PHASE_RESOURCE	R_1111	CHAR
100000000000000616	00000240	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000240	0005	PPPI_PHASE_SHORT_TEXT	Charge input substances	CHAR
100000000000000616	00000240	0006	PPPI_EXTERNAL_PHASE	CHARGE1	CHAR
100000000000000616	00000250	0001	PPPI_PHASE	1020	CHAR
100000000000000616	00000250	0002	PPPI_OPERATION	1000	CHAR
100000000000000616	00000250	0003	PPPI_PHASE_RESOURCE	R_1111	CHAR
100000000000000616	00000250	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000250	0005	PPPI_PHASE_SHORT_TEXT	Analyze and adjust	CHAR
100000000000000616	00000250	0006	PPPI_EXTERNAL_PHASE	ADJUST1	CHAR
100000000000000616	00000260	0001	PPPI_PHASE	1020	CHAR
100000000000000616	00000260	0002	PPPI_PARAMETER_NAME	MIX_TIME	CHAR
100000000000000616	00000260	0003	PPPI_PARAMETER_VALUE	1.5000000000000000E+01	NUM
100000000000000616	00000260	0004	PPPI_UNIT_OF_MEASURE	MIN	CHAR
100000000000000616	00000270	0001	PPPI_PHASE	1030	CHAR
100000000000000616	00000270	0002	PPPI_OPERATION	1000	CHAR
100000000000000616	00000270	0003	PPPI_PHASE_RESOURCE	R_1111	CHAR
100000000000000616	00000270	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000270	0005	PPPI_PHASE_SHORT_TEXT	Transfer to reactor unit	CHAR
100000000000000616	00000270	0006	PPPI_EXTERNAL_PHASE	TRANSFER1	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000280	0001	PPPI_DATA_REQUEST_TYPE	SIMPLE	CHAR
100000000000000616	00000280	0002	PPPI_MESSAGE_CATEGORY	DPREAD	CHAR
100000000000000616	00000280	0003	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000280	0004	PPPI_DATA_POINT_NAME	DENSITY_READ	CHAR
100000000000000616	00000280	0005	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE	CHAR
100000000000000616	00000280	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000280	0007	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000280	0008	PPPI_UNIT_OF_MEASURE	KG/M3	CHAR
100000000000000616	00000280	0009	PPPI_OPERATION	1000	CHAR
100000000000000616	00000280	0010	PPPI_PHASE	1030	CHAR
100000000000000616	00000290	0001	PPPI_PHASE	2010	CHAR
100000000000000616	00000290	0002	PPPI_OPERATION	2000	CHAR
100000000000000616	00000290	0003	PPPI_PHASE_RESOURCE	R_1121	CHAR
100000000000000616	00000290	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000290	0005	PPPI_PHASE_SHORT_TEXT	Prepare reaction basic substance	CHAR
100000000000000616	00000290	0006	PPPI_EXTERNAL_PHASE	PREPARE1	CHAR
100000000000000616	00000300	0001	PPPI_PHASE	2010	CHAR
100000000000000616	00000300	0002	PPPI_PARAMETER_NAME	PH_VALUE	CHAR
100000000000000616	00000300	0003	PPPI_PARAMETER_VALUE	6.5000000000000000E+00	NUM
100000000000000616	00000300	0004	PPPI_PARAMETER_VALUE_MIN	6.0000000000000000E+00	NUM

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000300	0005	PPPI_PARAMETER_VALUE_MAX	7.0000000000000000E+00	NUM
100000000000000616	00000310	0001	PPPI_DATA_REQUEST_TYPE	SIMPLE	CHAR
100000000000000616	00000310	0002	PPPI_MESSAGE_CATEGORY	DPREAD	CHAR
100000000000000616	00000310	0003	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000310	0004	PPPI_DATA_POINT_NAME	PH1_END_OF_PHASE	CHAR
100000000000000616	00000310	0005	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE	CHAR
100000000000000616	00000310	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000310	0007	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000310	0008	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000310	0009	PPPI_UNIT_OF_MEASURE		CHAR
100000000000000616	00000310	0010	PPPI_OPERATION	2000	CHAR
100000000000000616	00000310	0011	PPPI_PHASE	2010	CHAR
100000000000000616	00000320	0001	PPPI_PHASE	2020	CHAR
100000000000000616	00000320	0002	PPPI_OPERATION	2000	CHAR
100000000000000616	00000320	0003	PPPI_PHASE_RESOURCE	R_1121	CHAR
100000000000000616	00000320	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000320	0005	PPPI_PHASE_SHORT_TEXT	Add mixture from operation 100	CHAR
100000000000000616	00000320	0006	PPPI_EXTERNAL_PHASE	CHARGE2	CHAR
100000000000000616	00000330	0001	PPPI_PHASE	2030	CHAR
100000000000000616	00000330	0002	PPPI_OPERATION	2000	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000330	0003	PPPI_PHASE_RESOURCE	R_1121	CHAR
100000000000000616	00000330	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000330	0005	PPPI_PHASE_SHORT_TEXT	Reaction takes place!	CHAR
100000000000000616	00000330	0006	PPPI_EXTERNAL_PHASE	REACTION1	CHAR
100000000000000616	00000340	0001	PPPI_PHASE	2030	CHAR
100000000000000616	00000340	0002	PPPI_PARAMETER_NAME	PH_VALUE	CHAR
100000000000000616	00000340	0003	PPPI_PARAMETER_VALUE	6.5000000000000000E+00	NUM
100000000000000616	00000340	0004	PPPI_PARAMETER_VALUE_MIN	6.0000000000000000E+00	NUM
100000000000000616	00000340	0005	PPPI_PARAMETER_VALUE_MAX	7.0000000000000000E+00	NUM
100000000000000616	00000350	0001	PPPI_DATA_REQUEST_TYPE	SIMPLE	CHAR
100000000000000616	00000350	0002	PPPI_MESSAGE_CATEGORY	DPREAD	CHAR
100000000000000616	00000350	0003	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000350	0004	PPPI_DATA_POINT_NAME	PH1_END_OF_PHASE	CHAR
100000000000000616	00000350	0005	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE	CHAR
100000000000000616	00000350	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000350	0007	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000350	0008	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000350	0009	PPPI_UNIT_OF_MEASURE		CHAR
100000000000000616	00000350	0010	PPPI_OPERATION	2000	CHAR
100000000000000616	00000350	0011	PPPI_PHASE	2030	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000360	0001	PPPI_PHASE	2040	CHAR
100000000000000616	00000360	0002	PPPI_OPERATION	2000	CHAR
100000000000000616	00000360	0003	PPPI_PHASE_RESOURCE	R_1121	CHAR
100000000000000616	00000360	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000360	0005	PPPI_PHASE_SHORT_TEXT	Discharge to condensation unit	CHAR
100000000000000616	00000360	0006	PPPI_EXTERNAL_PHASE	DISCHARGE1	CHAR
100000000000000616	00000370	0001	PPPI_PHASE	3010	CHAR
100000000000000616	00000370	0002	PPPI_OPERATION	3000	CHAR
100000000000000616	00000370	0003	PPPI_PHASE_RESOURCE	R_1131	CHAR
100000000000000616	00000370	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000370	0005	PPPI_PHASE_SHORT_TEXT	Receive mixture from operation	CHAR
100000000000000616	00000370	0006	PPPI_EXTERNAL_PHASE	CHARGE2	CHAR
100000000000000616	00000380	0001	PPPI_PHASE	3020	CHAR
100000000000000616	00000380	0002	PPPI_OPERATION	3000	CHAR
100000000000000616	00000380	0003	PPPI_PHASE_RESOURCE	R_1131	CHAR
100000000000000616	00000380	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000380	0005	PPPI_PHASE_SHORT_TEXT	Heating operation	CHAR
100000000000000616	00000380	0006	PPPI_EXTERNAL_PHASE	HEAT1	CHAR
100000000000000616	00000390	0001	PPPI_DATA_REQUEST_TYPE	REPEATED	CHAR
100000000000000616	00000390	0002	PPPI_MESSAGE_CATEGORY	DPREAD	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000390	0003	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000390	0004	PPPI_DATA_POINT_NAME	TEMP_1	CHAR
100000000000000616	00000390	0005	PPPI_REQUESTED_VALUE	PPPI_DATA_POINT_VALUE	CHAR
100000000000000616	00000390	0006	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000390	0007	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000390	0008	PPPI_UNIT_OF_MEASURE	C	CHAR
100000000000000616	00000390	0009	PPPI_OPERATION	3000	CHAR
100000000000000616	00000390	0010	PPPI_PHASE	3020	CHAR
100000000000000616	00000400	0001	PPPI_PHASE	3030	CHAR
100000000000000616	00000400	0002	PPPI_OPERATION	3000	CHAR
100000000000000616	00000400	0003	PPPI_PHASE_RESOURCE	R_1131	CHAR
100000000000000616	00000400	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000400	0005	PPPI_PHASE_SHORT_TEXT	Condensing operation	CHAR
100000000000000616	00000400	0006	PPPI_EXTERNAL_PHASE	CONDENS1	CHAR
100000000000000616	00000410	0001	PPPI_PHASE	3040	CHAR
100000000000000616	00000410	0002	PPPI_OPERATION	3000	CHAR
100000000000000616	00000410	0003	PPPI_PHASE_RESOURCE	R_1131	CHAR
100000000000000616	00000410	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000410	0005	PPPI_PHASE_SHORT_TEXT	Discharge to filter press	CHAR
100000000000000616	00000410	0006	PPPI_EXTERNAL_PHASE	DISCHARG1	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000420	0001	PPPI_PHASE	4010	CHAR
100000000000000616	00000420	0002	PPPI_OPERATION	4000	CHAR
100000000000000616	00000420	0003	PPPI_PHASE_RESOURCE	R_1140	CHAR
100000000000000616	00000420	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000420	0005	PPPI_PHASE_SHORT_TEXT	Drying operation	CHAR
100000000000000616	00000420	0006	PPPI_EXTERNAL_PHASE	DRY1	CHAR
100000000000000616	00000430	0001	PPPI_PHASE	4010	CHAR
100000000000000616	00000430	0002	PPPI_PARAMETER_NAME	TEMPERATURE	CHAR
100000000000000616	00000430	0003	PPPI_PARAMETER_VALUE	6.5000000000000000E+01	NUM
100000000000000616	00000430	0004	PPPI_PARAMETER_VALUE_MIN	6.0000000000000000E+01	NUM
100000000000000616	00000430	0005	PPPI_PARAMETER_VALUE_MAX	7.0000000000000000E+01	NUM
100000000000000616	00000430	0006	PPPI_UNIT_OF_MEASURE	C	CHAR
100000000000000616	00000440	0001	PPPI_MESSAGE_CATEGORY	PI_QMSMR	CHAR
100000000000000616	00000440	0002	PPPI_PROCESS_ORDER	Y-300/PCS1	CHAR
100000000000000616	00000440	0003	PPPI_OPERATION	4000	CHAR
100000000000000616	00000440	0004	PPPI_INSPECTION_LOT	000000000000	CHAR
100000000000000616	00000440	0005	PPPI_INSPECTION_ CHARACTERISTIC	10	CHAR
100000000000000616	00000440	0006	PPPI_REQUESTED_VALUE	PPPI_NUMBER_OF_INSPECTIONS	CHAR
100000000000000616	00000440	0007	PPPI_REQUESTED_VALUE	PPPI_INSPECTION_SHORT_TEXT	CHAR

CRID	FTNO	FVNO	ATNAM	ATWRT	ATFOR
100000000000000616	00000440	0008	PPPI_REQUESTED_VALUE	PPPI_INSPECTION_RESULT	CHAR
100000000000000616	00000440	0009	PPPI_REQUESTED_VALUE	PPPI_EVENT_DATE	CHAR
100000000000000616	00000440	0010	PPPI_REQUESTED_VALUE	PPPI_EVENT_TIME	CHAR
100000000000000616	00000450	0001	PPPI_PHASE	4020	CHAR
100000000000000616	00000450	0002	PPPI_OPERATION	4000	CHAR
100000000000000616	00000450	0003	PPPI_PHASE_RESOURCE	R_1140	CHAR
100000000000000616	00000450	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000450	0005	PPPI_PHASE_SHORT_TEXT	Receive mixture from operation	CHAR
100000000000000616	00000450	0006	PPPI_EXTERNAL_PHASE	CHARGE2	CHAR
100000000000000616	00000460	0001	PPPI_PHASE	4030	CHAR
100000000000000616	00000460	0002	PPPI_OPERATION	4000	CHAR
100000000000000616	00000460	0003	PPPI_PHASE_RESOURCE	R_1140	CHAR
100000000000000616	00000460	0004	PPPI_PLANT_OF_RESOURCE	1100	CHAR
100000000000000616	00000460	0005	PPPI_PHASE_SHORT_TEXT	Discharge to cans	CHAR
100000000000000616	00000460	0006	PPPI_EXTERNAL_PHASE	DISCHARG1	CHAR

Message Categories Used

Characteristics of message category PI_CRST:

Characteristic	Description	Req
PPPI_PROCESS_ORDER	Process order	
PPPI_CONTROL_RECIPE	Control Recipe	X
PPPI_CONTROL_RECIPE_STATUS	Status of a control recipe	X
PPPI_EVENT_DATE	Date of event	X
PPPI_EVENT_TIME	Time of event	X

Characteristics of message category PI_OPST:

Characteristic	Description	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	X
PPPI_OPERATION_STATUS	Operation status	X
PPPI_EVENT_DATE	Date of event	X
PPPI_EVENT_TIME	Time of event	X

Characteristics of message category PI_PHST:

Characteristic	Description	Req.
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	X
PPPI_PHASE_STATUS	Phase status	X
PPPI_YIELD_TO_CONFIRM	Quantity to be confirmed	
PPPI_UNIT_OF_MEASURE	Unit of measure	
PPPI_REASON_FOR_VARIANCE	Reason for variance	
PPPI_CONFIRMATION_SHORT_TEXT	Confirmation short text	
PPPI_PHASE_RESOURCE	Primary resource of a phase	
PPPI_PLANT_OF_RESOURCE	Resource plant	

Characteristic	Description	Req.
PPPI_EVENT_DATE	Date of event	X
PPPI_EVENT_TIME	Time of event	X

Characteristics of message category PI_CONS:

Characteristic	Description	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	
PPPI_MATERIAL	Material number	X
PPPI_BATCH	Batch	
PPPI_STORAGE_LOCATION	Storage location	
PPPI_RESERVATION	Reservation	
PPPI_RESERVATION_ITEM	Item no. of the reservation	
PPPI_MATERIAL_CONSUMED	Quantity of consumed material	X
PPPI_UNIT_OF_MEASURE	Unit of measure	X
PPPI_FINAL_ISSUE	Indicator: final issue	
PPPI_EVENT_DATE	Date of event	X
PPPI_EVENT_TIME	Time of event	X

Characteristics of message category PI_PROD:

Characteristic	Description	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	
PPPI_MATERIAL	Material number	X
PPPI_BATCH	Batch	
PPPI_STORAGE_LOCATION	Storage location	
PPPI_ORDER_ITEM_NUMBER	Order item no.	

Characteristic	Description	Req
PPPI_MATERIAL_PRODUCED	Quantity of material produced	X
PPPI_UNIT_OF_MEASURE	Unit of measure	X
PPPI_DELIVERY_COMPLETE	Delivery complete	
PPPI_EVENT_DATE	Date of event	X
PPPI_EVENT_TIME	Time of event	X

Characteristics of message category PI_QMSMR:

Characteristic	Description	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	
PPPI_INSPECTION_LOT	Inspection lot	X
PPPI_INSPECTION_CHARACTERISTIC	Inspection characteristic	X
PPPI_INSPECTION_RESULT	Inspection result	X
PPPI_UNIT_OF_MEASURE	Unit of measure	
PPPI_NUMBER_OF_INSPECTIONS	Number of inspections	
PPPI_STANDARD_DEVIATION	Standard deviation (QM)	
PPPI_INSPECTION_SHORT_TEXT	Inspection short text	
PPPI_EVENT_DATE	Date of event	X
PPPI_EVENT_TIME	Time of event	X

Characteristics of message category DPREAD:

Characteristic	Description	Req
PPPI_DATA_POINT_NAME	Data point name	X
PPPI_DATA_POINT_VALUE	Data point value	X
PPPI_EVENT_DATE	Date of event	X
PPPI_EVENT_TIME	Time of event	X
PPPI_OPERATION	Operation number	
PPPI_PHASE	Phase number	X

Characteristic	Description	Req
PPPI_PROCESS_ORDER	Process order	X
PPPI_UNIT_OF_MEASURE	Unit of measure	X

Process Instruction Categories Used

Characteristics of process instruction category AORD_1:

No.	Characteristic	Description	Value
10	PPPI_ORDER_QUANTITY	Order quantity	
20	PPPI_RESOURCE_NETWORK	Resource network	
30	PPPI_PLANT_OF_RESOURCE	Resource plant	

Characteristics of process instruction category APHASE_1:

No.	Characteristic	Description	Value
10	PPPI_PHASE	Phase number	
20	PPPI_OPERATION	Operation number	
30	PPPI_PHASE_RESOURCE	Primary resource of a phase	
40	PPPI_PLANT_OF_RESOURCE	Resource plant	
45	PPPI_PHASE_SHORT_TEXT	Phase short text	
50	PPPI_EXTERNAL_PHASE	Phase name in control system	

Characteristics of process instruction category APHPAR_1:

No.	Characteristic	Description	Value
10	PPPI_PHASE	Phase number	
20	PPPI_PARAMETER_NAME	Parameter name	
30	PPPI_PARAMETER_VALUE	Parameter value	
31	PPPI_PARAMETER_VALUE_MIN	Upper tolerance limit	
32	PPPI_PARAMETER_VALUE_MAX	Lower tolerance limit	
40	PPPI_UNIT_OF_MEASURE	Unit of measure	

Characteristics of process instruction category AMAT_1:

No.	Characteristic	Description	Value
10	PPPI_MATERIAL	Material number	
20	PPPI_MATERIAL_ITEM	Item no. of material component	
40	PPPI_OPERATION	Operation number	
50	PPPI_PHASE	Phase number	
60	PPPI_MATERIAL_QUANTITY	Material quantity	
70	PPPI_UNIT_OF_MEASURE	Unit of measure	

Characteristics of process instruction category ACONS_1:

No.	Characteristic	Description	Value
20	PPPI_MESSAGE_CATEGORY	Message category	PI_CONS
30	PPPI_PROCESS_ORDER	Process order	
40	PPPI_REQUESTED_VALUE	Requested value	PPPI_OPERATION
50	PPPI_REQUESTED_VALUE	Requested value	PPPI_PHASE
60	PPPI_REQUESTED_VALUE	Requested value	PPPI_MATERIAL
70	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
80	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME
90	PPPI_REQUESTED_VALUE	Requested value	PPPI_MATERIAL_CONSUMED
100	PPPI_REQUESTED_VALUE	Requested value	PPPI_UNIT_OF_MEASURE

Characteristics of process instruction category APROD_1:

No.	Characteristic	Description	Value
20	PPPI_MESSAGE_CATEGORY	Message category	PI_PROD
30	PPPI_PROCESS_ORDER	Process order	
40	PPPI_REQUESTED_VALUE	Requested value	PPPI_OPERATION
50	PPPI_REQUESTED_VALUE	Requested value	PPPI_PHASE
60	PPPI_REQUESTED_VALUE	Requested value	PPPI_MATERIAL

No.	Characteristic	Description	Value
70	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
80	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME
90	PPPI_REQUESTED_VALUE	Requested value	PPPI_MATERIAL_PRODUCED
100	PPPI_REQUESTED_VALUE	Requested value	PPPI_UNIT_OF_MEASURE

Characteristics of process instruction category ACRST_I:

No.	Characteristic	Description	Value
10	PPPI_DATA_REQUEST_TYPE	Type of proc. data request	
20	PPPI_MESSAGE_CATEGORY	Message category	PI_CRST
30	PPPI_PROCESS_ORDER	Process order	
40	PPPI_CONTROL_RECIPE	Control recipe	
50	PPPI_REQUESTED_VALUE	Requested value	PPPI_CONTROL_RECIPE_STATUS
60	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
70	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME

Characteristics of process instruction category AOPST_I:

No.	Characteristic	Description	Value
20	PPPI_MESSAGE_CATEGORY	Message category	PI_OPS
30	PPPI_PROCESS_ORDER	Process order	
40	PPPI_REQUESTED_VALUE	Requested value	PPPI_OPERATION
50	PPPI_REQUESTED_VALUE	Requested value	PPPI_OPERATION_STATUS
60	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
70	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME

Characteristics of process instruction category APHST_I:

No.	Characteristic	Description	Value
20	PPPI_MESSAGE_CATEGORY	Message category	PI_PHST
30	PPPI_PROCESS_ORDER	Process order	
40	PPPI_REQUESTED_VALUE	Requested value	PPPI_OPERATION
50	PPPI_REQUESTED_VALUE	Requested value	PPPI_PHASE
60	PPPI_REQUESTED_VALUE	Requested value	PPPI_PHASE_STATUS
70	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
80	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME

Characteristics of process instruction category AQMSMR_1:

No.	Characteristic	Description	Value
20	PPPI_MESSAGE_CATEGORY	Message category	PI_QMSMR
30	PPPI_PROCESS_ORDER	Process order	
40	PPPI_OPERATION	Operation number	
50	PPPI_INSPECTION_LOT	Inspection lot	
60	PPPI_INSPECTION_CHARACTERISTIC	Inspection characteristic	
70	PPPI_REQUESTED_VALUE	Requested value	PPPI_NUMBER_OF_INSPECTIONS
80	PPPI_REQUESTED_VALUE	Requested value	PPPI_INSPECTION_SHORT_TEXT
90	PPPI_REQUESTED_VALUE	Requested value	PPPI_INSPECTION_RESULT
100	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
110	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME

Characteristics of process instruction category AREAD1:

No.	Characteristic	Description	Value
10	PPPI_DATA_REQUEST_TYPE	Simple proc. data request	
20	PPPI_MESSAGE_CATEGORY	Message category	DPREAD
30	PPPI_PROCESS_ORDER	Process order	
40	PPPI_DATA_POINT_NAME	Data point name	

No.	Characteristic	Description	Value
60	PPPI_REQUESTED_VALUE	Requested value	PPPI_DATA_POINT_VALUE
70	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
80	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME
90	PPPI_UNIT_OF_MEASURE	Unit of measure	
100	PPPI_OPERATION	Operation number	
110	PPPI_PHASE	Phase number	

Characteristics of process instruction category AREAD2:

No.	Characteristic	Description	Value
10	PPPI_DATA_REQUEST_TYPE	Repeated proc. data request	
20	PPPI_MESSAGE_CATEGORY	Message category	DPREAD
30	PPPI_PROCESS_ORDER	Process order	
41	PPPI_DATA_POINT_NAME	Data point name	
50	PPPI_REQUESTED_VALUE	Requested value	PPPI_DATA_POINT_VALUE
60	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_DATE
80	PPPI_REQUESTED_VALUE	Requested value	PPPI_EVENT_TIME
90	PPPI_UNIT_OF_MEASURE	Unit of measure	
100	PPPI_OPERATION	Operation number	

No.	Characteristic	Description	Value
110	PPPI_PHASE	Phase number	

Characteristics Delivered by SAP

Characteristic name	Characteristic description
PPPI_ACTIVITY	Activity to be confirmed
PPPI_AUTOMATIC_VALUE	Characteristic - automatic value assignment
PPPI_BATCH	Batch
PPPI_BUTTON_TEXT	Pushbutton text
PPPI_CALCULATED_VALUE	Characteristic to be calculated
PPPI_CALCULATION_FORMULA	Formula (process data calculation)
PPPI_CHANGING_PARAMETER	Changing parameter
PPPI_CONFIRMATION_SHORT_TEXT	Confirmation short text
PPPI_CONTROL_RECIPE	Control recipe
PPPI_CONTROL_RECIPE_STATUS	Status of a control recipe
PPPI_DATA_POINT_NAME	Data point name
PPPI_DATA_POINT_VALUES	Data point value
PPPI_DATA_REQUEST_TYPE	Type of the process data request
PPPI_DATE_CONSTANT	Constant - date
PPPI_DATE_VARIABLE	Variable - date
PPPI_DEFAULT_STRING	Default value - alphanumeric
PPPI_DEFAULT_VALUE	Default value - numeric
PPPI_DEFAULT_VARIABLE	Default value - variable
PPPI_DELIVERY_COMPLETE	Delivery complete
PPPI_EVENT_DATE	Date of event
PPPI_EVENT_TIME	Time of event
PPPI_EXPORT_PARAMETER	Export parameter
PPPI_EXTERNAL_OPERATION	Operation name in control system
PPPI_EXTERNAL_PHASE	Phase name in control system
PPPI_EXTERNAL_RECIPE	Recipe name in control system
PPPI_EXTERNAL_VALUE	External value
PPPI_FINAL_ISSUE	Indicator: final issue
PPPI_FLOAT_CONSTANT	Constant - floating point

Characteristic name	Characteristic description
PPPI_FLOAT_VARIABLE	Variable - floating point
PPPI_FUNCTION_DURING_DISPLAY	Function allowed in display
PPPI_FUNCTION_NAME	Function name
PPPI_IMPORT_PARAMETER	Import parameter
PPPI_INPUT_GROUP	Input group text
PPPI_INPUT_REQUEST	Input request text
PPPI_INSPECTION_CHARACTERISTIC	Inspection characteristic
PPPI_INSPECTION_LOT	Inspection lot
PPPI_INSPECTION_RESULT	Inspection result
PPPI_INSPECTION_SHORT_TEXT	Inspection short text
PPPI_INSTRUCTION	Control instruction
PPPI_LANGUAGE_OF_USER_STATUS	Maintenance language of user status
PPPI_MATERIAL	Material number
PPPI_MATERIAL_CONSUMED	Quantity of consumed material
PPPI_MATERIAL_ITEM	Item no. of material component
PPPI_MATERIAL_PRODUCED	Quantity of material produced
PPPI_MATERIAL_QUANTITY	Material quantity
PPPI_MATERIAL_SHORT_TEXT	Material description
PPPI_MAXIMUM_TABLE_SIZE	Maximum table size
PPPI_MESSAGE_CATEGORY	Message category
PPPI_MESSAGE_DESTINATION	Message destinations
PPPI_MESSAGE_TEXT	Message long text
PPPI_NOTE	Note
PPPI_NUMBER_OF_INSPECTIONS	Number of inspections
PPPI_OPERATION	Operation number
PPPI_OPERATION_LONG_TEXT	Operation long text
PPPI_OPERATION_SHORT_TEXT	Operation short text
PPPI_OPERATION_STATUS	Operation status
PPPI_OPERATION_USER_STATUS	User status of an operation
PPPI_ORDER_ITEM_NUMBER	Order item no.

Characteristic name	Characteristic description
PPPI_ORDER_QUANTITY	Order quantity
PPPI_PARAMETER_NAME	Parameter name
PPPI_PARAMETER_VALUE	Parameter value
PPPI_PARAMETER_VALUE_MIN	Lower tolerance limit
PPPI_PARAMETER_VALUE_MAX	Upper tolerance limit
PPPI_PHASE	Phase number
PPPI_PHASE_LONG_TEXT	Phase long text
PPPI_PHASE_RESOURCE	Primary resource of a phase
PPPI_PHASE_RESOURCE_LONG_TEXT	Long text of a primary resource
PPPI_PHASE_RESOURCE_SHORT_TEXT	Short text of primary resource
PPPI_PHASE_SHORT_TEXT	Phase short text
PPPI_PHASE_STATUS	Phase status
PPPI_PHASE_USER_STATUS	User status of a phase
PPPI_PLANT_OF_RESOURCE	Resource plant
PPPI_PREDECESSOR	Number of preceding phase
PPPI_PROCEED_ON_FAILURE	Proceed at invalid input
PPPI_PROCESS_ORDER	Process order
PPPI_PROCESS_ORDER_TEXT	Short text for process order
PPPI_REASON_FOR_VARIANCE	Reason for variance
PPPI_REQUESTED_VALUE	Input value (data request)
PPPI_RESERVATION	Reservation
PPPI_RESERVATION_ITEM	Item no. of reservation
PPPI_RESOURCE_NETWORK	Resource network
PPPI_SIGNATURE	Signature
PPPI_SIGNATURE_AUTHORIZATION	Authorization for signature
PPPI_SOURCE	Source
PPPI_STANDARD_DEVIATION	Standard deviation (QM)
PPPI_STD_VALUE_PARAMETER_ID	Standard value/parameter ID
PPPI_STORAGE_LOCATION	Storage location
PPPI_STRING_CONSTANT	Constant - alphanumeric

Characteristic name	Characteristic description
PPPI_STRING_VARIABLE	Variable - alphanumeric
PPPI_SUCCESSOR	Number of the succeeding phase
PPPI_TEXT_FOR_INVALID_INPUT	Error message (invalid input)
PPPI_TIME_CONSTANT	Constant - time
PPPI_TIME_VARIABLE	Variable - time
PPPI_TRANSACTION_CODE	Transaction
PPPI_UNIT_OF_MEASURE	Unit of measure
PPPI_VALIDATION_FORMULA	Validation rule (input validation)
PPPI_VARIABLE	Variable
PPPI_YIELD_TO_CONFIRM	Yield to be confirmed