Printer Communication Controller

PCC 400-x-BM

for connection to the Batching Master

User manual PCC 400 Batching Master-Software

only valid in connection with the installation guide
PCC 400-x from software 00.10.12
(x = variant)

Version 18.1

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Safety information

The personnel for installation, commissioning, diagnostics and maintenance must be fulfil the following requirements:

- Trained, qualified specialists must have a relevant qualification for this specific function and task
- Are authorised by the plant owner/operator
- Are familiar with federal/national regulations
- Before beginning work, the specialist staff must have read and understood the instructions in the User Manual and supplementary documentation as well as in the certificates (depending on the application)
- Following instructions and basic conditions

The operating personnel must fulfil the following requirements:

- Being instructed and authorised according to the requirements of the task by the facility's owner-operator
- Following the instructions in these Operating Instructions

Validity of Installation and Operating Instructions

- This User Manual applies to all PCC 400-x models with connection to Batching Master only in connection to the installation manual PCC 400-x (x = hardware version)
  At the time of creation of this manual variants A, B, C and D were available. Other variants are in preparation.
- The hardware is described in a separate manual. It is not possible to operate Batching Master and Pipeline Master on one PCC 400 simultaneously.
- Your IBS agent will be able to give you information about any improvements or modifications.
- The manufacturer is not responsible for damage caused by incorrect or unauthorised use. Conversions and changes to the instrument must not be made, otherwise the certification and guarantee become invalid.

If in this manual e. g. a specified serial COM is named, please use the Installation Guide for more information about this.

IT security

We turn automatic safety updates (patches) off in the operating system. If the PCC 400 is attached to the network/internet, the operator or the responsible network administrator must guarantee that corresponding security procedures are taken up (e. g. install Firewall).

The PCC 400 should be operated on an uninterruptable power supply.

Attention!

Turn off the PCC 400 not by switching off the power supply.

Please press the power button on the PCC 400

or turn off via the software.

After briefly pressing the power button all running programs at the PCC 400 get closed within about 60 seconds and shuts off after further 15 seconds. Don't press the button for more than 1 second, because the PCC 400 then shuts off without previously shut down the operating system. This means that important data and programs could be destroyed on the hard disk.

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1 System description

The PCC 400 is a PC whose software starts automatically after power on. This is adapted to the batch controller Batching Master and is used to print and store metering data.

Other housings (e. g. mini-pc, standard housing, 19”...) and configurations are possible. Only the 'PCC 400 Batching Master' software is described in this manual.

Mixed operation of Batching Master and Pipeline Master at the same PCC 400 is not possible. For the exact hardware description please refer to the installation guide PCC 400-x.

The PCC 400 is a Modbus RTU Master. The Batching Masters are connected by an interface converter to the PCC 400. Intrinsically save Batching Masters need additional a IPC 300 i for safety isolation.

The connection of mouse, keyboard and monitor are recommended.

1.1 Password of the system administrator

The PCC 400 system administrator password is “IBSBatchControl” ex works. Please change this password. Open the terminal mode by pressing CTRL, Alt and T simultaneously and type

passwd [username].

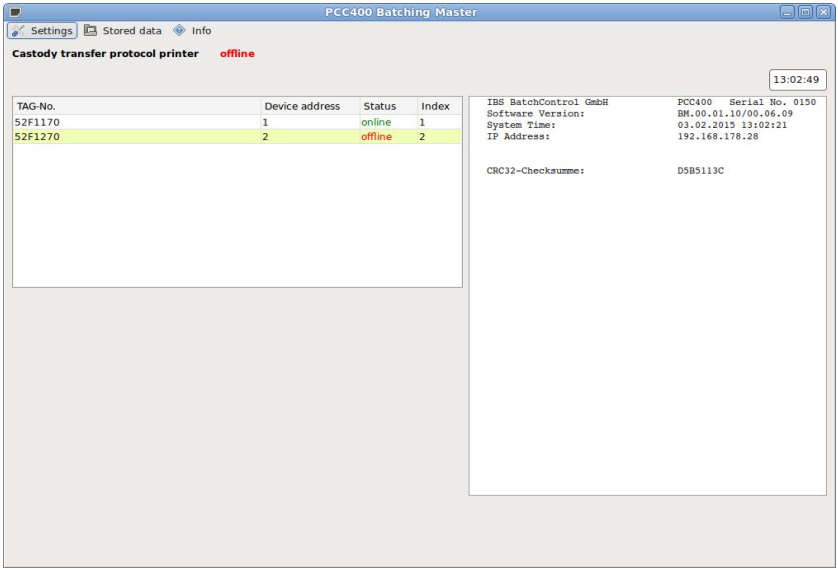
The username is “pcc” ex works and displayed on the right top. Therefore you enter “passwd pcc” in the terminal. Confirm this with the RETURN key. Please take the further petitions from the terminal window.

2 Starting up PCC-Batching Master

If the PCC 400 is switched on, the operation system and the program will start automatically.

If there is no Batching Master registered at the PCC 400 please register these as described in section 2.3.1.

2.1 Printout at restart PCC



If the printer which is used for custody transfer printouts is connected correctly on the left side at top the massage “custody transfer protocol printer online” and the following text is printed:

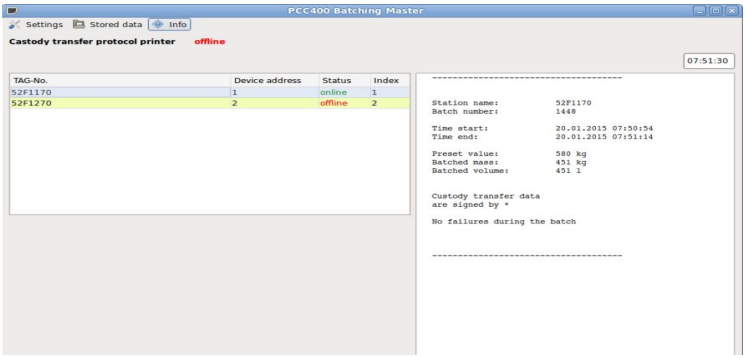
IBS BatchControl GmbH	PCC 400 Serial No.:xxxx
Software Version:	BM.xx.xx.xx / xx.xx.xx
System Time:	dd.mm.yyyy hh:mm:ss
IP:	xxx.xxx.x.xxx
CRC32-Checksumme:	xxxxxxxxxx

The first part of the software version is the custody transfer version number, the second part is the not custody transfer version number. The connected Batching Masters are listed in the left part of the window.

If there is no Batching Master available, they must be logged (see section 2.3.1 TAG settings). The IP address is only used for network connection.

The IP address for LAN0 is set to 192.168.1.77. LAN1 obtains his address from the DHCP server.

The PCC 400 is ready to use. All batches are printed and shown similar in the right part of the display window.



In the Batching Master programming level function 4.11.1 the printout over PCC 400 is switched on.

The printer delay is set in function 4.11.2. This is used if the flow shall be counted short time after the batch is stopped. The custody transfer data block is written after this delay time and the PCC 400 gets the correct batch values by the Batching Master.

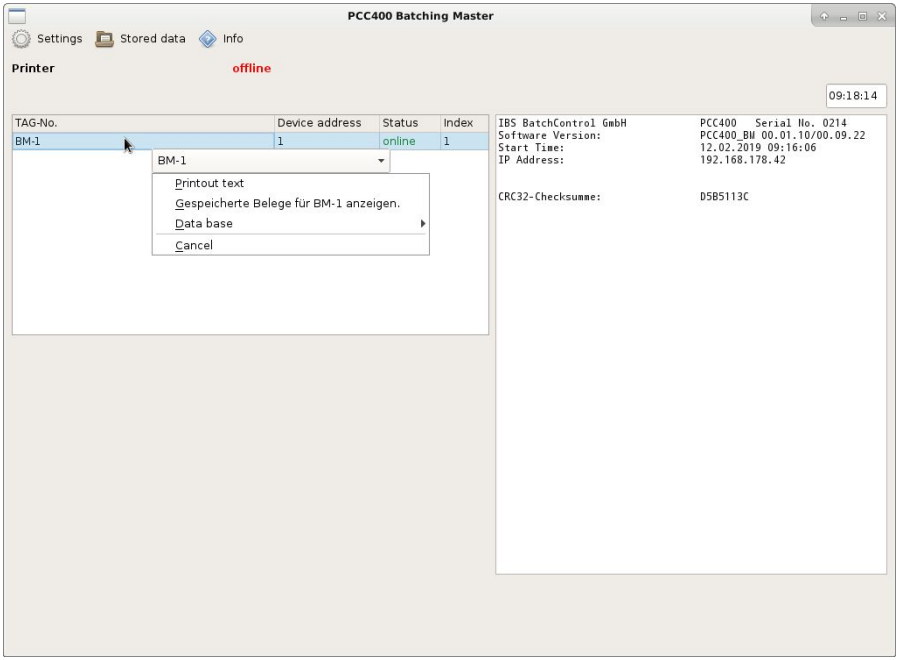
The termination conditions of a batch, if a printer is not connected or active, are defined in function 4.11.3. If no stop is selected, a batch could be done without an active printer. If no start is selected a new batch could only be done with active printer. A new batch can be started after the last batch was printed as an original document or stored in the PCC 400.

If the connection from the PCC 400 to the Batching Master is interrupted, the error is shown in the display of the PCC 400. The status display "online" changes to "offline".

2.2 Configure printouts

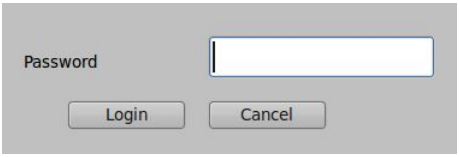
You can define text blocks which can be printed before and after the custody transfer printout. These texts can be written with a built in text editor. The PCC400 program starts automatically. To edit the text blocks press the right mouse key at the Batching Master in the list left side of the window. A window with following menus appears:

- edit text
- show documents from [station name]
- data base
- cancel

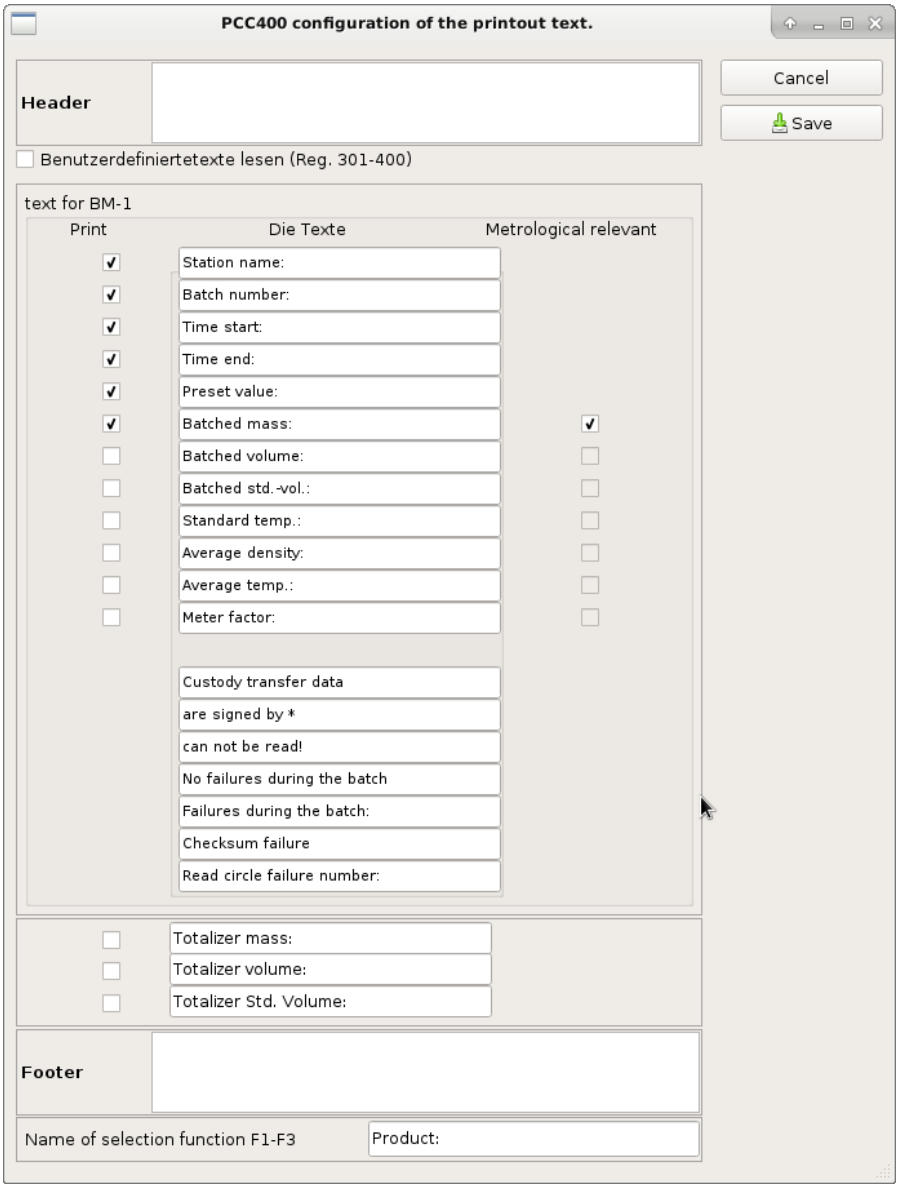


After you choose edit text, a password is required and the following window appears.

The standard password at delivery is “password”.



If a dongle is plugged in and the Batching Master is marked as custody transfer, only the header, footer, start and end text can be changed.



The check mark in the column “Print” activates this line for the printout. All data is stored in the data base and in the CSV or PDF file.

The texts are pre-set and appear in front of the printed line. These texts can be translated into national languages of other countries. If the check mark “metrological relevant” is set, the dongle inserted and sealed, then this value is printed included stars.

The printout format is as following:

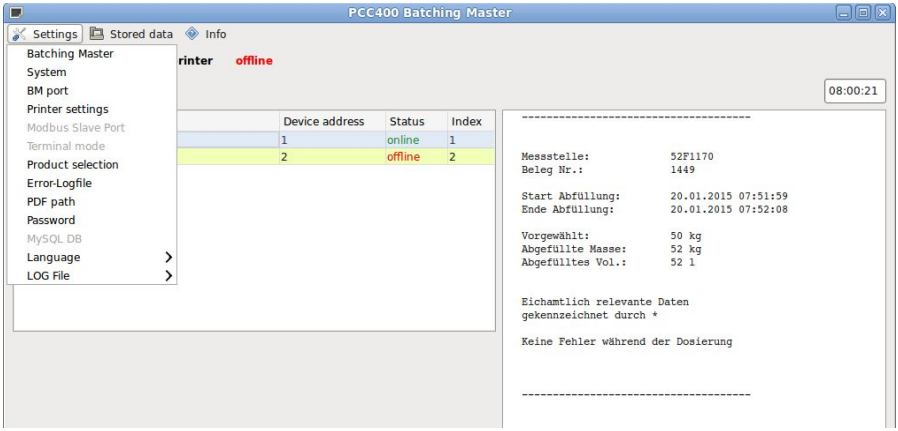
Station name:	xxxxxxxx
Batch number:	xx
Time start:	dd.mm.yyyy hh:mm:ss
Time end:	dd.mm.yyyy hh:mm:ss

Preset value:		xxxx
Batched Mass:	*	xxxx*
Custody transfer data are signed by *.		
(possible error massages)		

Texts from the higher-level system can be written into the Batching Master registers 301 to 400, which are to appear on the printout above the measuring point. There are 20 registers (40 characters fixed) for each line. In order for these to be printed, please activate the checkbox "Read user-defined texts (register 301 - 400).

2.3 Global settings

The menu item Settings is located in the upper bar. As long as the dongle is plugged in, metrological relevant settings cannot be adjusted.

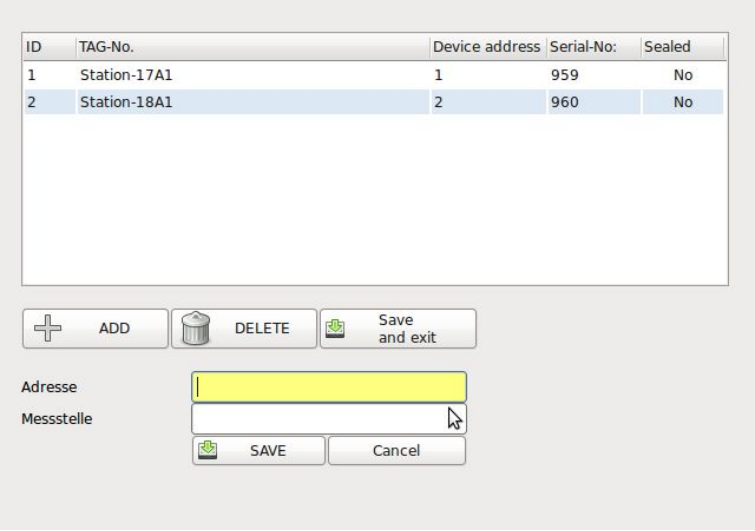


The password is queried before changes can be made. The default password at delivery is "password" and is valid for five minutes. It must then be entered again.

How to change the password is described in section 2.3.10.

2.3.1 TAG settings

Please select the menu Settings – TAG:



Click on Add and at first enter the Modbus address and the measuring point name of the connected Batching Master.

As soon as the Batching Master is marked with "Yes" in the column "Sealed" and the dongle is inserted, a lock symbol appears in the column Sealed. It is no longer possible to change metrologically relevant settings. Data relevant to the metrological verification are enclosed in *.

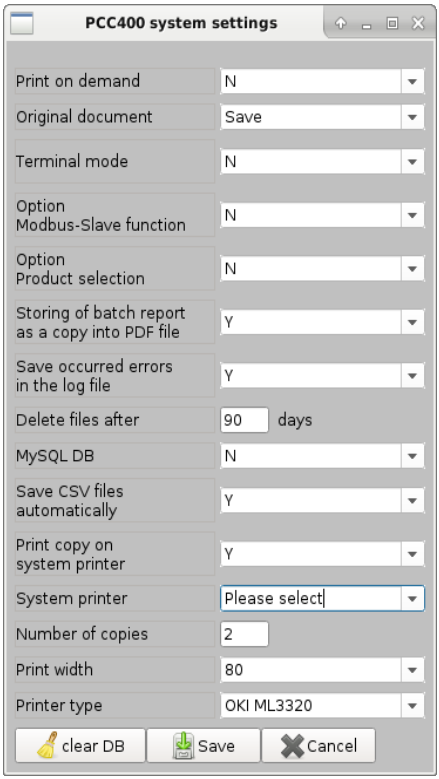
As long as the dongle is inserted, no further Batching Master can be marked as custody transfer.

The serial numbers of the Batching Masters are recognized when the window is closed and displayed the next time the window is opened.

To change the TAG-No. double click the line which you want to change.

2.3.2 System settings

Select the menu Settings - System settings.



The documents are printed on request (Y) or always (N). If the document is printed always, specify in the next selection field whether the original document is to be printed or saved. If the original document is saved, the copy is printed.

You can activate the options terminal mode (see section 2.3.6), the Modbus slave function (see section 2.3.5) and the product selection (see section 2.3.7).

A copy of the batch report can be stored as a PDF file (see section 2.3.9).

Errors at the Batching Masters can be written into a log-file during the batch(see section 2.3.13).

The data of the internal data base will be deleted after the registered number of days. If 0 days is set, the data is never deleted.

The connection to an external MySQL data base (option, see section 2.3.11) can be activated.

A system printer specified in the operating system can be selected. By default, only the PDF printer is installed. All other printers must be installed.

The number of copies is specified.

The print width of the printer connected to COM can be selected between 40 or 80 characters.

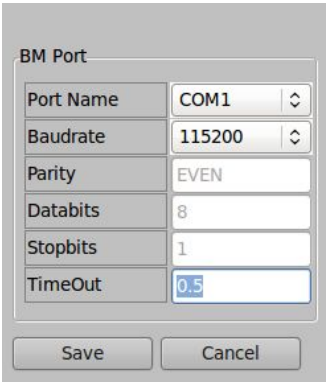
The OKI ML-3320, the EPSON TM-U220B or the EPSON TM-U295 can be selected as printer type for this printer connected to COM.

The terminal mode, the Modbus slave function, product selection and the MySQL data base connection are options and must be agreed with the distribution before ordering.

2.3.3 Batching Master – Interface settings

You configure the interface for the connection to the Batching Masters in the menu BM Port.

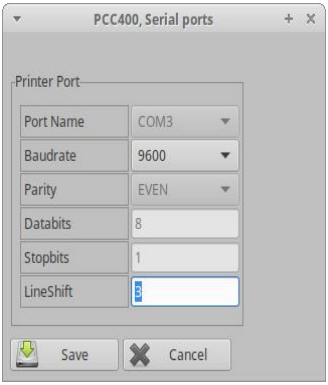
You can select between available serial COM-Ports, USB or LAN.



2.3.4 Printer – interface settings

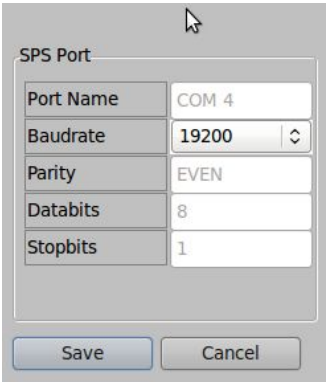
The printer settings are fixed by us.

Spaces at the left side of the paper are specified with LineShift.



2.3.5 Modbus Slave Port – settings (Option)

You set the baud rate of the Modbus slave interface. All other settings are fixed. The supervisory system (e. g. PLC) can only read (Modbus function 03) 17 permanently Modbus register listed in the following table.



Modbus Register	Beschreibung
1	Device Number LSW
2	Device Number MSW
3	Totaliser LSW
4	Totaliser MSW
5	Actual flow LSW
6	Actual flow MSW
7	Batched quantity LSW
8	Batched quantity MSW
9	Preselected Value LSW
10	Preselected Value MSW
11	Batch status
12	Analogue output (0 – 10000 equates 4 – 20 mA)
13	Batch number LSW
14	Batch number MSW
15	Error bits 0-15 (Batching Master register 5)
16	Error bits 16-31 (Batching Master register 6)
17	Batch active message
18	Error LSW, see Reg. 5
19	Error MSW, see Reg. 6
20	batch status, see Reg. 15
21	batch indication, see Reg. 16
22	preselection LSW, see Reg. 13
23	preselection MSW, see Reg. 14
24	batched mass LSW
25	batched mass MSW
26	batched volume LSW
27	batched volume MSW
28	batched standard volume LSW
29	batched standard volume MSW
30	current density LSW
31	current density MSW
32	Average density of the current batch LSW
33	Average density of the current batch MSW
34	Current temperature in °C
35	Temperature input for simulation
36	Current pressure in kg/m³ with 2 decimal places.
37	Pressure input for simulation

Modbus Register	Beschreibung
38	Current mass flow LSW
39	Current mass flow MSW
40	Current volume flow LSW
41	Current volume flow MSW
42	Current standard volume flow LSW
43	Current standard volume flow MSW
44	Totaliser LSW, see Reg. 7
45	Totaliser MSW, see Reg. 8
46	Flow input for simulation
47	Density input for simulation LSW
48	Density input for simulation MSW
49	Reference density LSW
50	Reference density MSW
51	Substitute value active: Bit0= temperature, Bit1= pressure, Bit2= density
52	Substitute value pressure
53	Substitute value temperature
54	Substitute value density LSW in x,xx kg/m³
55	Substitute value density MSW
56	Totaliser mass LSW
57	Totaliser mass MSW
58	Totaliser volume LSW
59	Totaliser volume MSW
60	Totaliser standard volume LSW
61	Totaliser standard volume MSW
62-67	Reserve

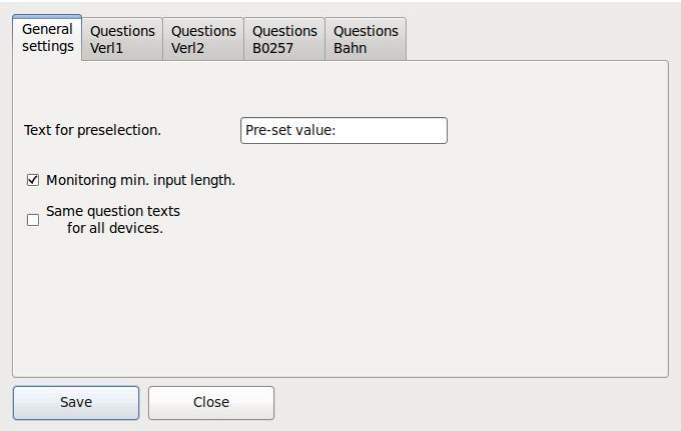
Additionally it can be accessed on all Modbus registers of the Batching Master specified for function 06 with the Modbus function 06. This can be used e. g. for register 58 (Start), 59 (stop) or 500 (terminal function).

2.3.6 Terminal-Modus (Option)

You can require up to 10 data by the user prior to the batch with the terminal function. For example stock no., Product no., User no. or others can be requested, printed and stored in the data base after the batch.

For using the terminal mode the Batching Master terminal mode must be active. Press the RC-key of the Batching Master to start the terminal mode. The required inputs have to be done before you can start the batch.

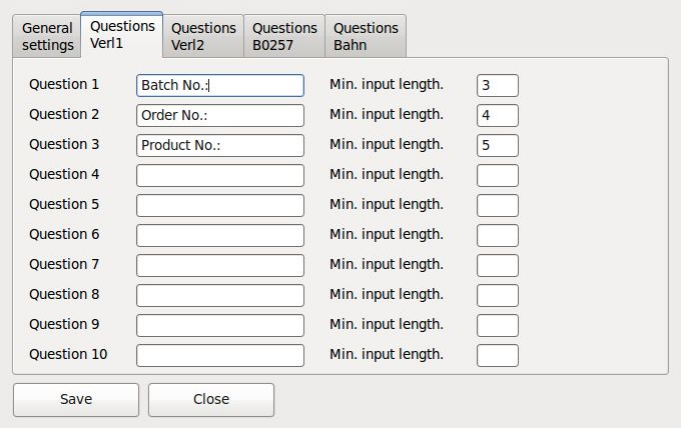
The question text for the preselection quantity is entered in General settings.



The minimum input length of the answers can be supervised.

If the questions for all units are the same, select the second check box.

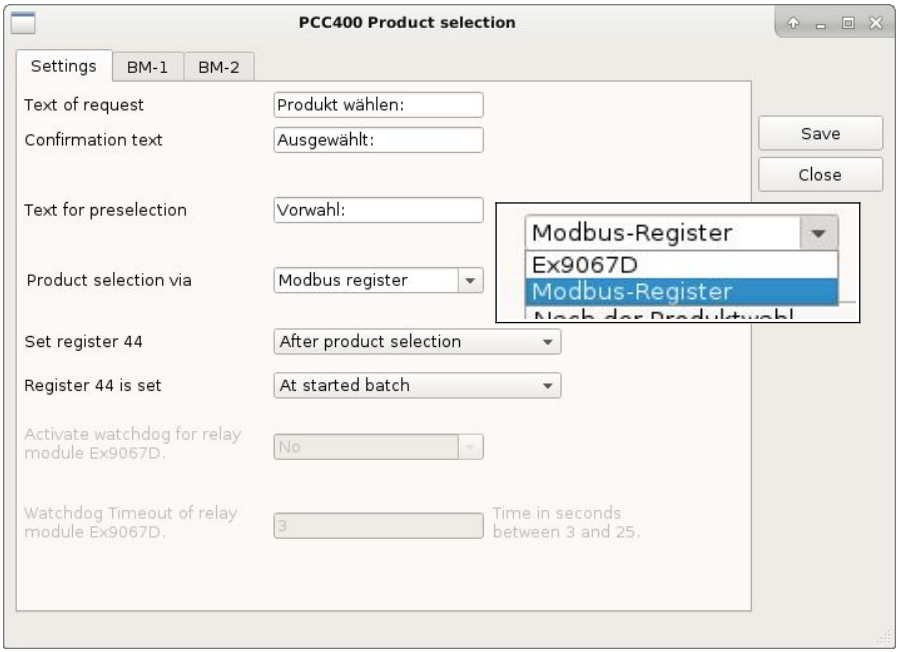
In the further riders each question text and the minimum length for the answer are defined.



2.3.7 Product selection (option)

For product selection, the terminal function of the Batching Master must be activated. Additionally, at least one relay module is required for each Batching Master. The relay module is preconfigured by us and operated on the same RS-485 bus as the Batching Master. These relays are used to switch different product paths.

As a selection, the product can also be written by the Batching Master only into Modbus register 44. Then the product path must be read out e.g. by a PLC that monitors register 44. The product paths are then switched by the PLC.



In the general settings, you specify which text is to be displayed for the product selection. The confirmation text is then displayed with the product name after you have entered the selection.

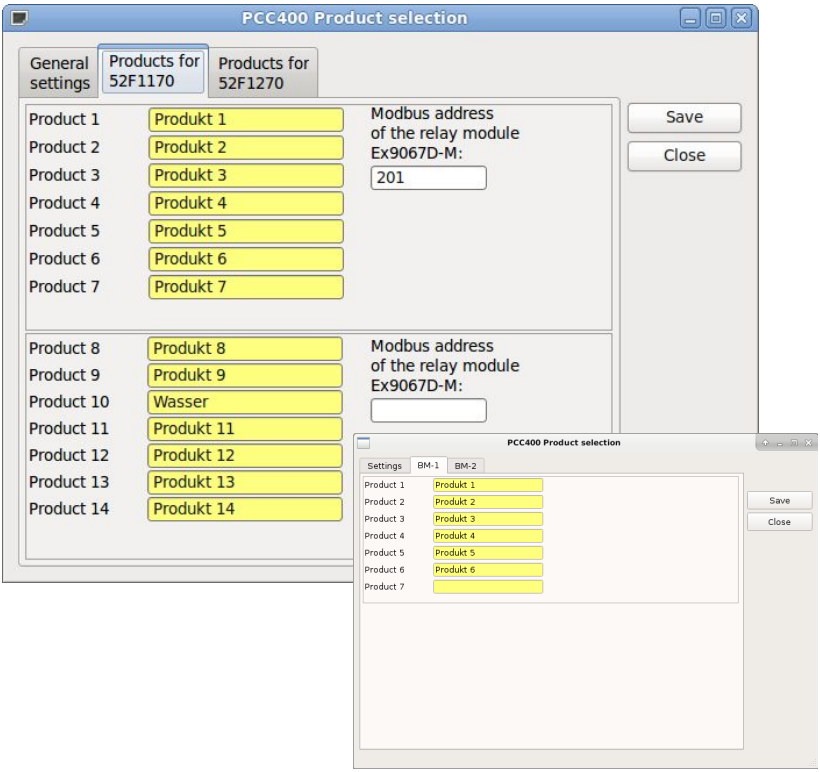
Then enter the text for the preselected quantity.

Product selection can be made via Modbus registers (with connected PLC) or via relay modules.

The switch-on conditions of the Modbus register or relay contact (DO) are set in the last two settings. The switch-on time DO (or Set Register 44) defines whether the contact switches after "Start", after "SET" (preselection) or after the product selection. The duty cycle DO (or Register 44 is set) can be during the entire batch including interruptions or only during started batch (DOS left in the display of the Batching Master or BC20).

A watchdog can be activated in the relay modules. If the watchdog is active, you must also make the settings for the watchdog in the last two input fields in the PCC.

Only by using relay modules enter in the next tab (Products for xxxx) the Modbus addresses for the relay modules. The entered measuring point name (see section 2.3.1) is displayed in the corresponding tab (here e. g. Products for 52F1170). Enter the product names in the yellow fields. If not all product paths are required, leave unneeded fields empty. Then this product cannot be selected.



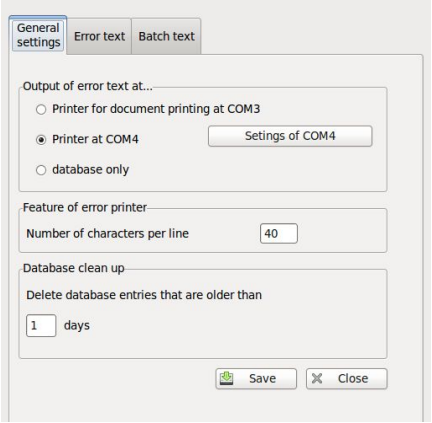
In order to start a batch, you press the Batching Master key [RC] first. The text of request is indicated at the Batching Master. After entering a value between 1 to 16 (limited by the number of products) with [SET], the selected product name is indicated for confirming. The confirmation text is indicated in the upper line, the in “Products” stored product is indicated in the lower line. After confirming with [SET] the question text for preselect value appears in the upper line. After the input of the preselect value in the lower line with [SET] the associated relay for this product is active. The Batching Master switches from terminal mode to the batch mode. Start the batch with [START].

The information about the selected product is printed and stored in the data base after the batch.

2.3.8 Error-Log file

Occurred errors on the Batching Masters can be stored in the data base and/or printed.

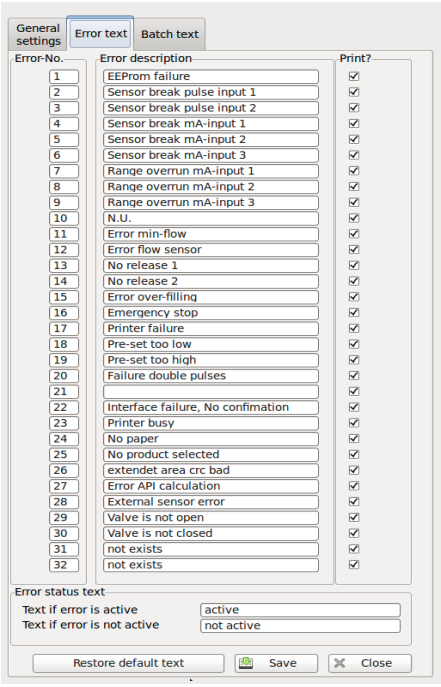
Error messages can be printed on the printer for custody transfer protocols or on other printers.



Please mark “database only” if only storing in the data base is required.

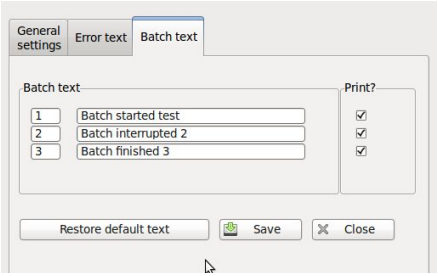
Set the maximum printable character per line (e. g. 40 for POS printer).

The data will be deleted after the registered number of days. If 0 days is set, the data will be not deleted.



You can enter the error event details in the next tab. So you are able to customise the language. Remove the hook in the right column if the error shall not be printed.

The last tab is used for batch text input.

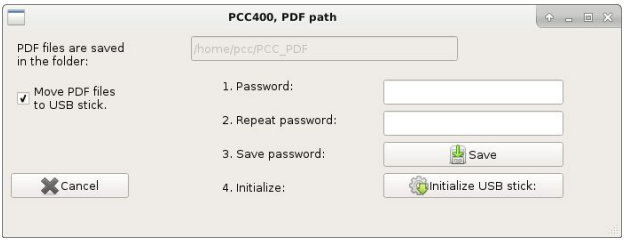


2.3.9 Storing the batch report as a copy into a PDF file

After you set this function in the system settings to YES, the storage place for the PDF files is */home/pcc/PCC_PDF*.

USB-Storage-Devices are also possible.

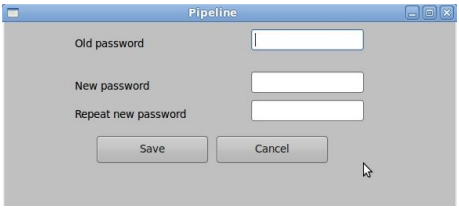
After plugging a USB-Storage-Device in all available PDF files are moved on the USB-Storage and deleted in the PCC.



Enter a password and repeat the entry in the second field. Confirm the password by saving it. Then initialize the USB stick by clicking on the next field.

2.3.10 Password

You should change the standard password (password) to a private password. Please keep the password safe carefully, because we don't have any possibility of resetting this password.



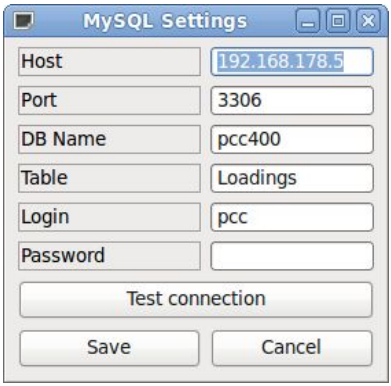
After the password was entered correctly, one can carry out petitions without renewed password input also in other menu items for five minutes. The password must be entered once more only after this time.

2.3.11 MySQL Data base connection (option)

An external MySQL database can be connected to the PCC 400 on request. The determined values and informations are written in the database after every batch. For this the following attitudes must be carried out:

Menu Settings / System Settings: set MySQL DB to „Y“
Menu Settings: choose MySQL DB

The following windows opens:



The system informations of your MySQL database must be typed in here. Please ask your responsible administrator.

The MySQL administrator has to lay out the database name, the login name and the password for the database. The tables are produced by the PCC automatically in the MySQL database. The PCC can write only in the database.

The user PCC needs the following rights for some schemes:

PCC database (e. g. pcc400)	Select, Insert, Update, Delete, Create
information_schema	Select

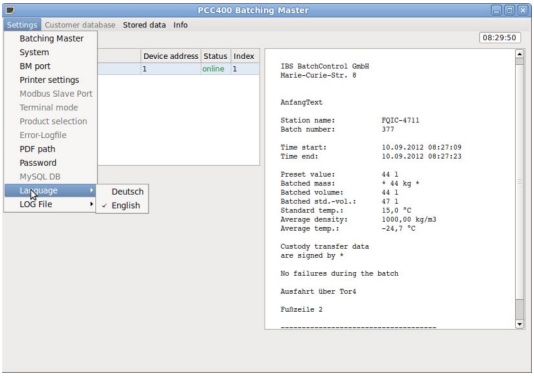
Please clarify the database connection and the exact function with our sales employees before the order.

For every batch the following column names exist:

Column name	***Data type***	***Description***
id	int(11)	Primary key auto increment
TAG_number	varchar(20)	
Batch_Number	int(6)	
Batch_Start	datetime	
Batch_End	datetime	
Preset_Value	varchar(25)	
Batched_Mass	varchar(25)	
Batched_Volume	varchar(25)	
Batched_St_Volume	varchar(25)	Batched standard volume
Ref_Temp	varchar(25)	Standard temperature
AvDensity	varchar(25)	Average density
AvTemp	varchar(25)	Average temperature
Product	varchar(32)	Selected product
Input1	varchar(32)	Input 1 (terminal function)
Input2	varchar(32)	Input 2 (terminal function)
Input3	varchar(32)	Input 3 (terminal function)
Input4	varchar(32)	Input 4 (terminal function)
Input5	varchar(32)	Input 5 (terminal function)
Input6	varchar(32)	Input 6 (terminal function)
Input7	varchar(32)	Input 7 (terminal function)
Input8	varchar(32)	Input 8 (terminal function)
Input9	varchar(32)	Input 9 (terminal function)
Input10	varchar(32)	Input 10 (terminal function)

2.3.12 Language

You can set the language directly to German, English or Russian.



2.3.13 Log file

A log file for our developers can be produced. The following attitudes are possible:

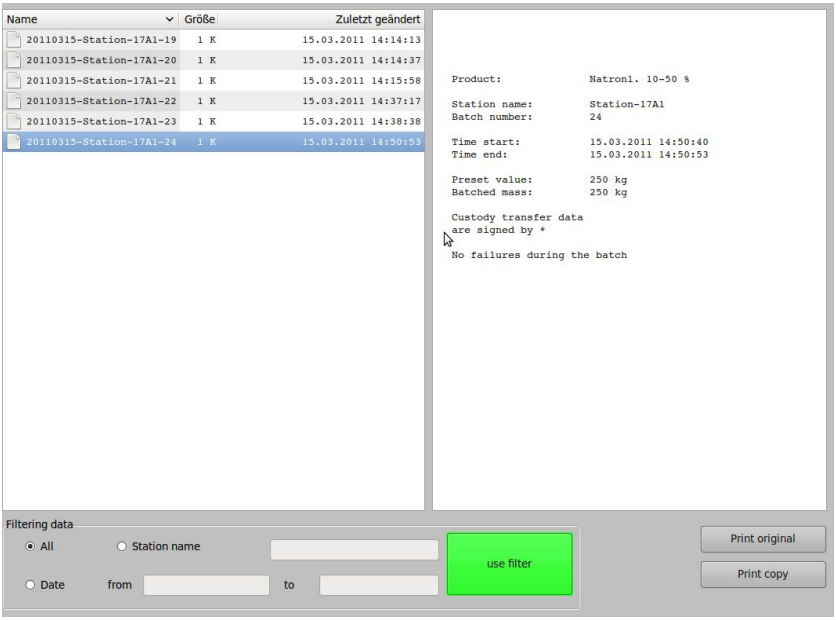
- write
- do not write
- delete.

In the delivery state no log file is written. Please switch this over only according to consultation with us.

2.4 Stored data

The menu stored data opens a new window with the choice possibility to show printouts and database.

2.4.1 Show printouts



The existing pieces of evidence are listed on the left. The file name is formed automatically by the date (YYYYMMDD), the station name and the serial batch number of this station:

e. g. 20090430-NAME-480

Select the desired batch with the mouse.

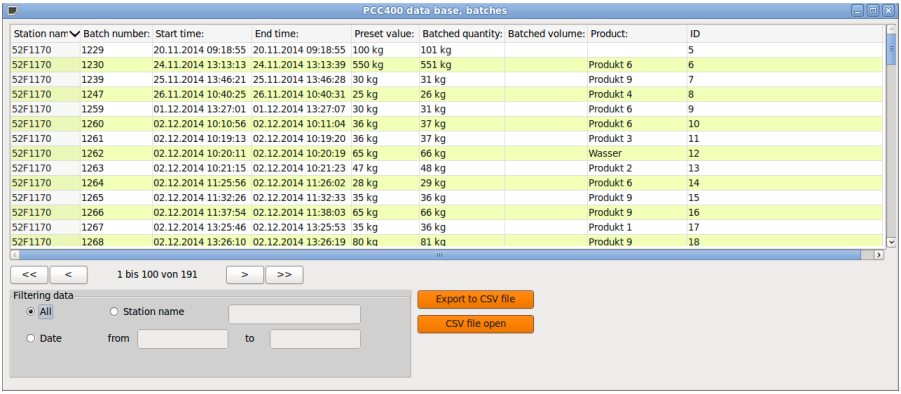
The content of the file are announced at the right window and can be printed. By pressing print original the original document is printed. With print copy a copy of the original is printed. “duplicate” is published at the copy in the topmost line.

As soon as an original was printed, the original file is indicated as duplicate (e. g. 20090430-NAME-480-duplicate) and “duplicate” is published at the topmost line. A new original cannot be printed any more.

To find the sought-after piece of evidence faster, the data can be filtered for TAG-number or date.

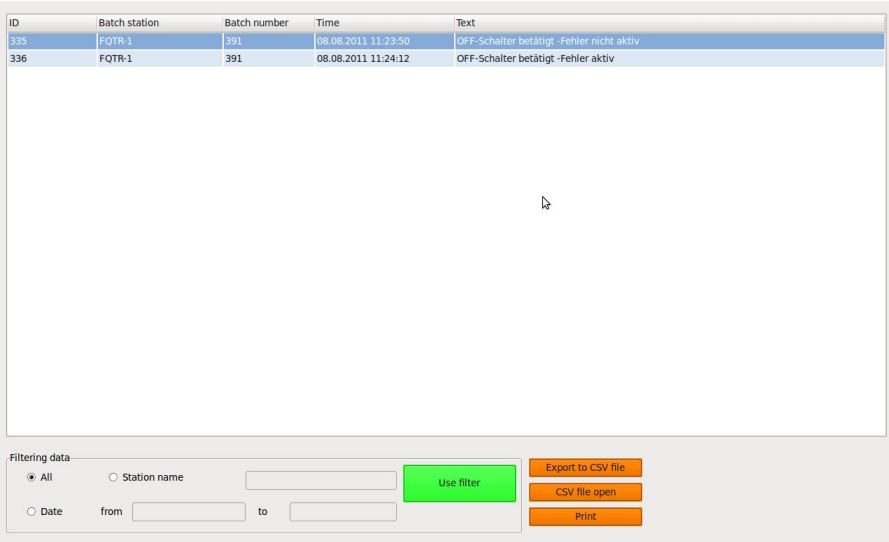
2.4.2 Database – Batches

To find the sought-after piece of evidence faster, the data can be filtered for TAG-number or date. All information of the last batches is announced in tabular form. The selected batches can then be exported or opened as a Calc table.



If you have selected a batch with the mouse click, you can by the same window double-click as in case of “stored documents” open and print the piece of evidence directly.

2.4.3 Database – Occurred Errors



All faults appeared to the Batching Masters are listed here.

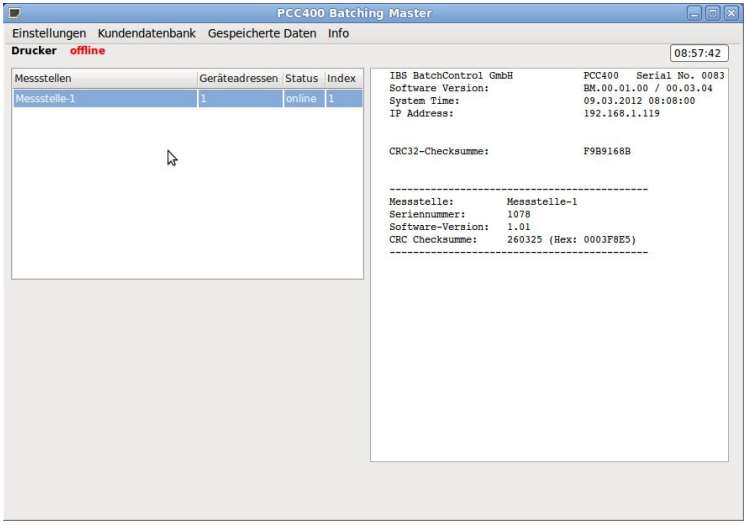
If the Batching Master faults have been removed by the operator very fast, it can happen that this isn't listed since the system needs a little time, particularly if several Batching Masters are attached, to poll all Batching Masters on continuously.

The entries in the data base can be sorted by ID, batch station, batch number and time. After this you can export the selected batches or open this as a Calc table.

2.5 Info menu

2.5.1 PCC 400 info

Informations of software version and checksum are shown.

2.5.2 Print BM info

A list with PCC 400 software version and all connected Batching Masters including the software version and checksum (decimal and HEX) over all metrological relevant data is printed.