How to: Realize a Mailing, working with Serial or TCP/IP interface

What this description is about

The following document describes with an example, how to set up a mailing, using the interface, according to the actual interface Inteface Manual

After setting up a proper connection from your hard- and software, the Leibinger Printer can be supplied with data and basically be controlled with commands and requested by queries.

Detailed information, how to establish a connection to the printer can be found in the "Manual LJ Interfaceprotocol", which will be supplied, if needed.
In general, the Protocol works with ASCII characters (8 Bit, 0x00…0xff) and any Soft- or hardware can be ued to transmit / receive those.

The following document is a general description and not specified for any special software, but describes possible action instructions, specific requests to the printer and the answer to those, as well as file transfer commands.

The document is an extract of the Leibinger interface protocol. For details of commands, parameters…etc., please refer to the latest version of the "Manual LJ Interfaceprotocol",

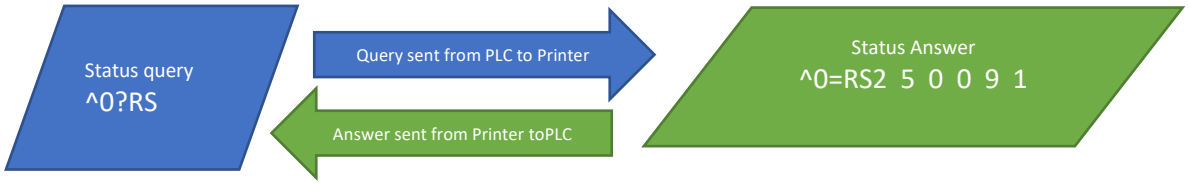
Concept and description of symbols and terms:

Term / Symbol	Description
PLC	Symbolical term for any connected hard- or software, such as terminal programs or e.g. a Siemens S7 PLC
Printer	Meaning a Leibinger printer of Jet3 or Jet2 neo family
PLC -> Printer / PLC <-> Printer	Uni- or bidirectional communication
	Data / Action from PLC
	Data / Action from Printer side
General Information	Each step of the procedure is numbered, followed by - A header describing the function and direction - A set of symbols showing the action taken by PLC or Printer - A table describing the according function and delivering details referring to the sample

Steps to follow

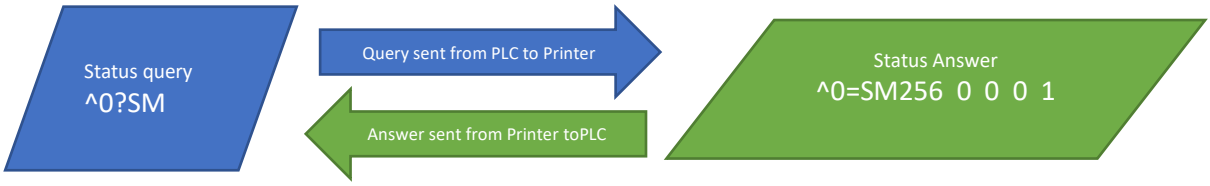
1. Status request and answer / PLC <-> Printer 3
2. Mailing status query and answer / PLC <-> Printer 3
3. Parameter transfer / PLC -> Printer 3
4. Mailing status query and answer / PLC <-> Printer 4
5. Sending first set of records / PLC -> Printer 4
6. Mailing status request and answer / PLC <-> Printer 5
7. Command to start the print out / PLC -> Printer 5
8. Status request and answer / PLC <-> Printer 6
9. Mailing status request and answer / PLC <-> Printer 6
10. Status request and answer / PLC <-> Printer 7
11. Mailing status request and answer / PLC <-> Printer 7
12. Sending next set of (50) records / PLC -> Printer 8
13. Mailing status query to check the Buffer Memory and State 8
14. Transfer the last Mailing record 9

1. Status request and answer / PLC <-> Printer



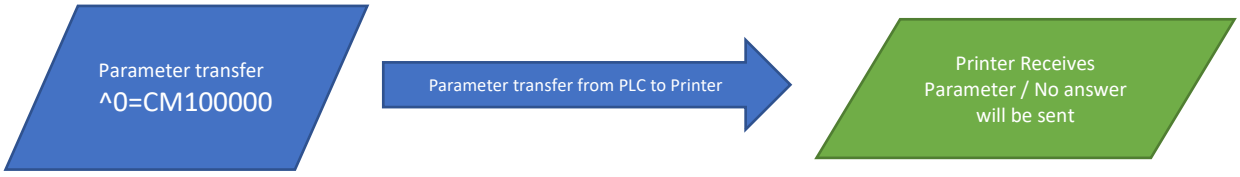
Status Query is sent from PLC to Printer *This request is "asking" the printer about the current state. For details about the status (answer from the printer), please refer to page 29 & 30 in the interface manual.*	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=RS2 5 0 0 9 1 [^0=RS] This is an answer to your Status Request [2] Nozzle is open [5] The printer is ready to print and in "standby" (red button) [0] No error is queue [0] The head cover is closed The actual speed is 9 dm/min(0,9m/min) [1] there have been changes in the job since the last status query
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

2. Mailing status query and answer / PLC <-> Printer



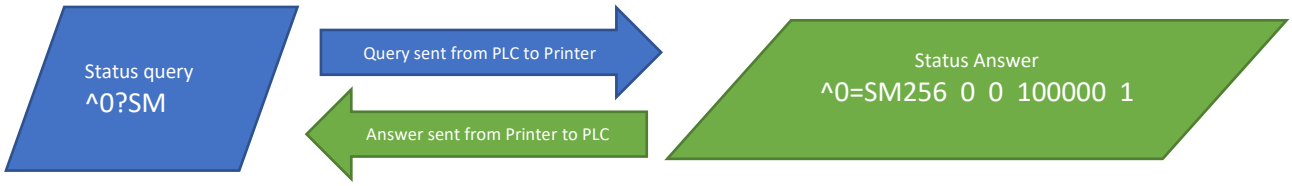
Status Query is sent from PLC to Printer *This request is "asking" the printer about the current state of the mailing and its buffer memory.* *For details about the status (answer from the printer), please refer to page 31 & 32 in the interface manual.*	Printer answers with the current state, for example as shown above. This answer is in "blocks" (pictured in colors below) and mean the following in this example. ^0=SM256 0 0 0 1 [^0=SM] This is an answer to your Mailing status query [256] A maximum of 256 records can be buffered in this buffer [0] The buffer is currently filled with 0 records [0] 0 was the record number of the last record being printed [0] the print will be stopped after record number 0 [1] 1 PrintGo´s were received since the last Jobload or received jobScript
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

3. Parameter transfer / PLC -> Printer



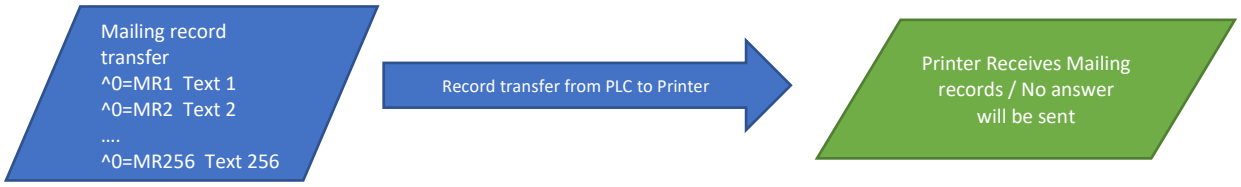
The parameter is sent from PLC to printer *The user defined parameter is sent to the printer with a command. The reason, why this parameter must be set, is to avoid an error message after the last record has been loaded. In the example above, the printer will stop after 100.000 records.*	
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

4. Mailing status query and answer / PLC <-> Printer



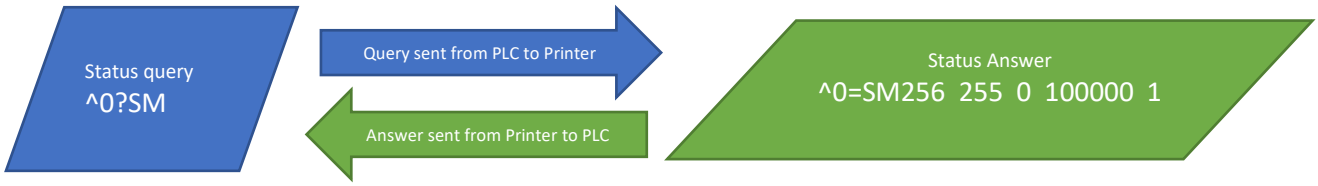
Status Query is sent from PLC to Printer *This status query is sent to check if the number of the "last record to be printed" was transferred correctly.* *The sample on the right shows, that parameter 4 has changed to "100000" and the parameter was transferred correctly* *For details about the status (answer from the printer), please refer to page 31 & 32 in the interface manual.*	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=SM256 0 0 100000 1 [^0=SM] This is an answer to your Mailing status query [256] A maximum of 256 records can be buffered in this buffer [0] The buffer is actually filled with 0 records [0] 0 was the record number of the last record being printed [100000] the print will be stopped after record number 100.000 [1] 1 PrintGo´s were received since the last Jobload or received jobscript
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

5. Sending first set of records / PLC -> Printer



The buffer is initially filled to the maximum, which is 256 entries. Those are sent from PLC to printer The consecutive numbering of records grants, that the printer does not miss or double print a record. To reach an optimal transfer speed all entries are send in one block! Each record needs to be completed with a carriage return. A Mailing record consists of sections as described below. and have to be in this order for every record. The example below show the meaning of the "sections" of the string to be sent ^0=MR<RECORD-NO><TAB><CONTENT> [^0=MR0] Tells the printer, that the following data is a Mailing record [Record-No] tells the printer, what record number the following data actually is. This number has to be consecutive for every following record to be sent [TAB] the Tabulator is the separator, which has to be added between record-No and data to be printed [Content] this is the actual data, that has to be printed (e.g. Text 1) *For more details about the "Mailing record" transfer, please refer to page 25 & 26 in the interface manual.*	
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

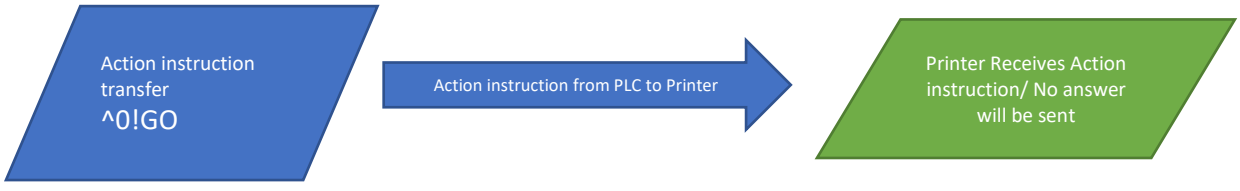
6. Mailing status request and answer / PLC <-> Printer



Status Query is sent from PLC to Printer *This status query is sent to check if all records were transferred correctly.* *The sample on the right shows, that parameter 2 has changed to "255" (details see right column)* *For details about the status (answer from the printer), please refer to page 31 & 32 in the interface manual.*	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=SM256 255 0 100000 1 [^0=SM] This is an answer to your Mailing status query [256] A maximum of 256 records can be buffered in this buffer [255] The buffer is actually filled with 255 records This means, that the printer has received all 256 records and has loaded one into the print buffer already. That´s why "only" 255 remain in the buffer. [0] 0 was the record number of the last record being printed [100000] the print will be stopped after record number 100.000 [1] 1 PrintGo´s were received since the last Jobload or received jobscript
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

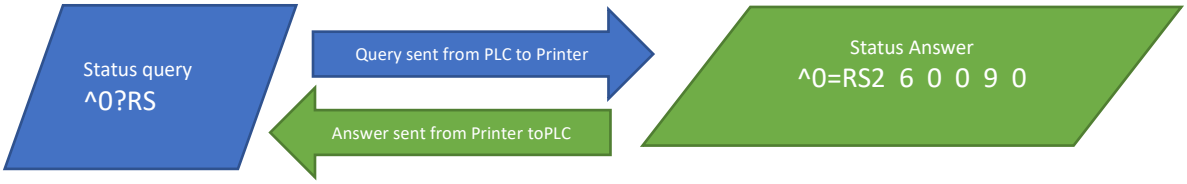
The printer is now ready to print and the printout can be started

7. Command to start the print out / PLC -> Printer



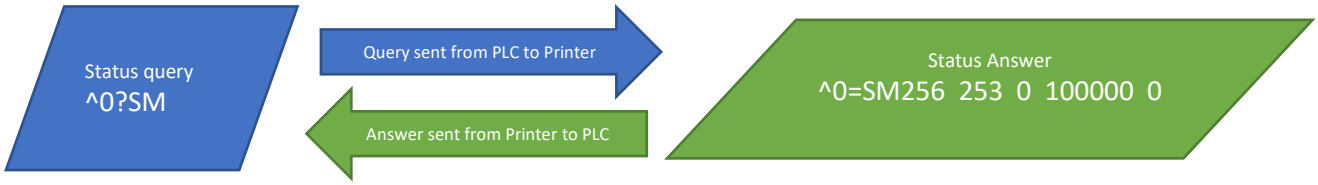
The command is sent from PLC to Printer The command ^0!GO starts the printout and the printer will start printing with the next PrintGo. The command is equal to a manual operation by pushing the green button on the display	
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

8. Status request and answer / PLC <-> Printer



Status Query is sent from PLC to Printer *This request is "asking" the printer about the current state. The answer in this example shows, that parameter 2 has changed to "6", which means the printer is in printing mode.* *For details about the status (answer from the printer), please refer to page 29 & 30 in the interface manual.*	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=RS2 6 0 0 9 0 [^0=RS] This is an answer to your Status Request [2] Nozzle is open [6] The printer now printing (green button) [0] No error is queue [0] The head cover is closed [9] The actual speed is 9 dm/min(0,9m/min) [0] there have been NO changes in the job since the last status query
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

9. Mailing status request and answer / PLC <-> Printer



Status Query is sent from PLC to Printer *This status query is sent to check if any "reachtion" is required. E.g. filling the buffer* *The sample on the right shows, that the buffer is filled, and everything es set correctly.* *For details about the status (answer from the printer), please refer to page 31 & 32 in the interface manual.*	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=SM256 255 0 100000 0 [^0=SM] This is an answer to your Mailing status query [256] A maximum of 256 records can be buffered in this buffer [253] The buffer is actually filled with 255 records This means, that the printer has received all 256 records and has loaded one into the print buffer already. That´s why "only" 255 remain in the buffer. [0] Record number 0 was the record number of the last record being printed [100000] the print will be stopped after record number 100.000 [0] 0 PrintGo´s were received since the last Jobload or received jobscript
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

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From now on the two status queries

- *^0?RS*
- *^0?SM*

will be repeated every second. Further block of records will be sent in blocks with each 50 records, in order to keep the load for the communication process at a low level. In case an error occurs, the print out will be stopped. After 50 records were printed the next block with 50 records shall be transferred. The transfer of 50 records as a block has been proved as a practical and good value in the field and practical for production speeds with easily ***more than 30 products per second.***

!!!Production is started now, and products are being printed!!!

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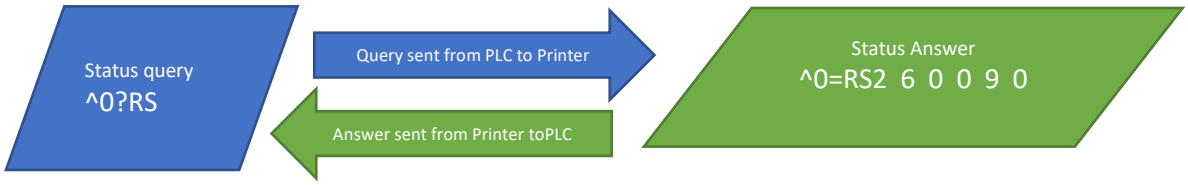
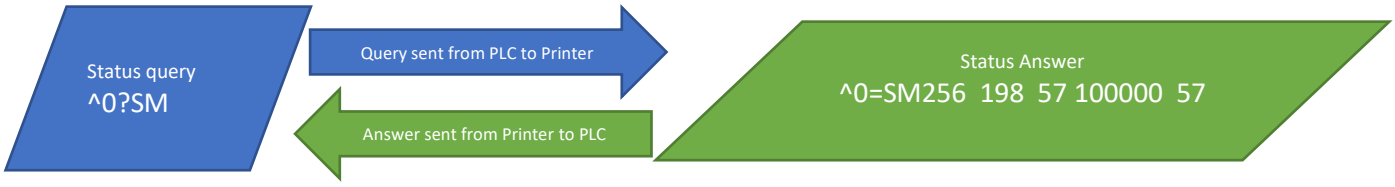
10. Status request and answer / PLC <-> Printer



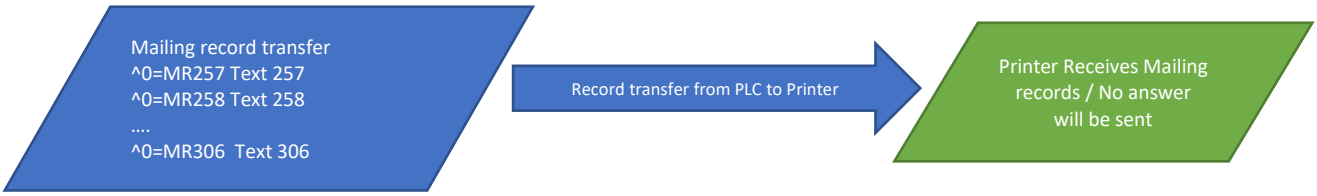
Status Query is sent from PLC to Printer *This request is "asking" the printer about the current state. The answer in this example shows, that everythin is still "fine". The printer shows errors and is printing.* *For details about the status (answer from the printer), please refer to page 29 & 30 in the interface manual.* Just as an example in this step, errors could occur at parameter 3. Here some examples, that are typical for MAILING applications (Bold means Error number, followed by description): **1015=**Mailing buffer full Mailing buffer is full. Too many data have been sent. **5043=**Mailing buffer empty During a print another print go appears and causes that the buffer is getting empty. Check the print go sensor for double trigger and if possible adjust the sensitivity. Use „hold of distance" to ignore double trigger. **1018=**Database index number invalid or missing Database index number is not allowed or is missing. **1019=**Database index number isn't consecutively numbered Database index numbers are not sequential	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=RS2 6 0 0 9 0 [^0=RS] This is an answer to your Status Request [2] Nozzle is open [6] The printer now printing (green button) [0] No error is queue [0] The head cover is closed [9] The actual speed is 9 dm/min (0,9m/min) [0] there have been NO changes in the job since the last status query
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

11. Mailing status request and answer / PLC <-> Printer



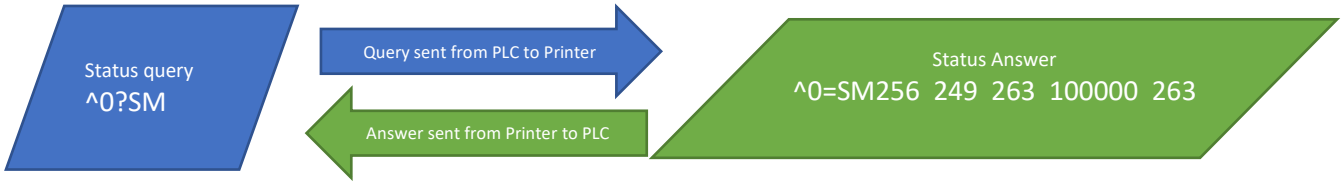
Status Query is sent from PLC to Printer *This status query is sent to check if any "reaction" is required. E.g. filling the buffer* *The sample on the right shows, that the buffer is can be refilled, because only 198 records remain in the buffer* *In this case, the PLC needs to send the next set of 50 records!* *For details about the status (answer from the printer), please refer to page 31 & 32 in the interface manual.*	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=SM256 198 57 100000 57 [^0=SM] This is an answer to your Mailing status query [256] A maximum of 256 records can be buffered in this buffer [198] The buffer is currently filled with 198 records This means, that the buffer can be filled with another set of (at least) 50 records [57] Record number 57 was the record number of the last record being printed [100000] the print will be stopped after record number 100.000 [57] 57 PrintGo´s were received since the last Jobload, or received jobscript
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

12. Sending next set of (50) records / PLC -> Printer



The buffer now initially filled with the next set of 50 records. Those are sent from PLC to printer The following record numbers need to be consecutive and "gapless", meaning if the last record being sent was "256" -> The first one to be sent must be "257"! The consecutive numbering of records grants, that the printer does not miss or double print a record. To reach an optimal transfer speed all entries are send in one block! Each record needs to be completed with a carriage return. A Mailing record consists of sections as described below. and have to be in this order for every record. The example below show the meaning of the "sections" of the string to be sent	
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

13. Mailing status query to check the Buffer Memory and State



Status Query is sent from PLC to Printer *This status query is sent to check if any "reaction" is required. E.g. filling the buffer* *The answer in this case shows, while sending the block and requesting the state again some records have already been produced. That´s why the buffer is not filled completely in this example.* *No "Action" from the PLC is required* *For details about the status (answer from the printer), please refer to page 31 & 32 in the interface manual.*	Printer answers with the current status, for example as shown above. This answer is in "blocks" (pictured in colours below) and mean the following in this example. ^0=SM256 249 263 100000 263 [^0=SM] This is an answer to your Mailing status query [256] A maximum of 256 records can be buffered in this buffer [249] The buffer is actually filled with 249 records This means, that the buffer can NOT be filled with another set of 50 records yet.-> no Mailing record transfer required. [263] Record number 263 was the record number of the last record being printed [100000] the print will be stopped after record number 100.000 [263] 263 PrintGo´s were received since the last Jobload or received jobscript
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

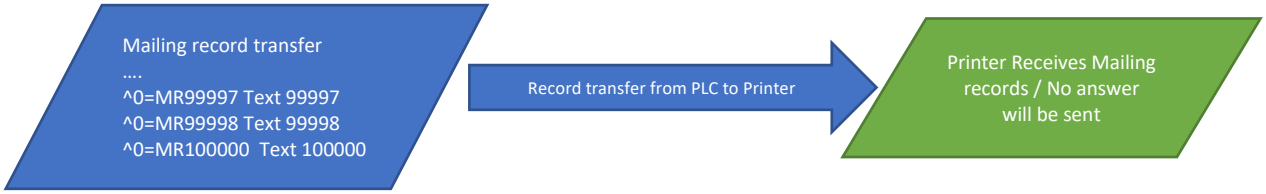
…
The two status queries

- *^0?RS*
- *^0?SM*

will be repeated every second. As soon as the buffer has space for the next 50 entries the next block will be sent.
This is repeated until all records from the data base will be transferred.

After the last block was transferred the buffer memory will empty step by step..

14. Transfer the last Mailing record



The Buffer has is now filled with the last record of the file (during production)	
For detailed descriptions of commands and states, please refer to the Leibinger interface protocol. Make sure, that every command, request or data/parameter transfer is completed with a carriage return!	

The printer will now print, until the last record has been produced.

After the last record has been produced, the printer will show a Message which can optionally also be observed in the answer to the status request (see LJ-Interface protocol)