

**Withdrawn; however may be applied on  
special agreement !**

**EUROMAP  
15**

**PROTOCOL FOR COMMUNICATION BETWEEN INJECTION  
MOULDING MACHINES AND A CENTRAL COMPUTER**

**Part 3**

**DATA SET TRANSFER**

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This recommendation was prepared by the Working Group "Electronic Control of Injection Moulding Machines" of EUROMAP.

It is part of the complete EUROMAP 15 recommendation.

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## 1. Introduction

Part 3 of the EUROMAP 15 recommendation, data set transfer, defines the telegrams and data structures necessary to transfer data sets from the machine controller to the central computer (data set upload) and from the central computer to the machine controller (data set download). Data sets can contain machine setting data, ASCII text, graphic data, quality table etc.. Data sets of any machine manufacturer can be transferred irrespective of their contents and format. However a data set from one manufacturer's controller may not be usable on the controller of another manufacturer. The central computer with its storage media merely acts as an archive for any type of data set.

Furthermore the machine controller can check the availability of a data set or delete a data set on the central computer.

## 2. General Statements

The following general statements must be paid attention to:

- During upload and download of a complete data set a cyclic standard question or any status command are possible, i.e. the telegrams 000, 006, 008, 009.
- EUROMAP 15 does not include any interpretation of the setting data and actual values. These data are manufacturer dependent. If an interpretation is necessary, it must be done on the central computer. In this case the central computer must have detailed information about the structure of the data set to be interpreted.
- Since data set contents are manufacturer specific and may consist of any binary data, the telegrams which contain the data blocks to be transferred (022 and 122) may contain any characters in the range 00 hex to FF hex.
- The following exceptions exist to the rule that data in predefined fields are right justified:
  - \* Data block numbers are always represented with leading zeros if needed.
  - \* If the last data block of the telegrams 022 and 122 contains less than 36 characters, data are left justified and unused bytes are filled with ASCII Blank (20 hex, blank).
- Data blocks must be transferred in consecutive order beginning with data block 0000. However the transfer of a data block may be repeated if necessary.

### 3. Types of Telegrams

#### 3.1 Definition of Telegrams from the Central Computer

**Telegram 020:           REQUEST FOR TRANSFER SPECIFICATION**  
contains no data bytes

**Telegram 021:           UPLOAD AND DOWNLOAD REQUEST**  
Byte | cont. | Description

Byte	cont.	Description
05	-N01-	transfer direction
	"1"	- download
	"2"	- upload
06..17	-A12-	data set id. no.

**Telegram 022:           DOWNLOAD BLOCK OF DATA**  
Byte | cont. | Description

Byte	cont.	Description
05..08	-N04-	block no. (0000 = first block)
09..44	-B36-	data-block (binary data if required)

**Telegram 023:           END OF DOWNLOAD TRANSMISSION**  
Byte | cont. | Description

Byte	cont.	Description
05..08	-N04-	block no. (last block sent + 1)

**Telegram 024:           TRANSFER ACKNOWLEDGEMENT**  
Byte | cont. | Description

Byte	cont.	Description
05	-N01-	transfer acknowledgement
	"0"	- negative
	"1"	- positive
	"2"	- Id-No. not available
	"3"	- Id-No. in use

**Telegram 025:           REQUEST FOR NEXT DATA BLOCK**  
Byte | cont. | Description

Byte	cont.	Description
05..08	-N04-	next expected data block-no.

#### 3.2 Extension of the List with Standard Answers

**Telegram 100:           STANDARD ANSWER**  
Byte | cont. | Description

Byte	cont.	Description
05..07	-N03-	request number
	"020"	- request for data set transfer

### 3.3 Definitions of Telegrams from the Machine Controller

#### **Telegram 120:           TRANSFER SPECIFICATION**

Byte	cont.	Description
05	-N01-	transfer specification
	"0"	- check availability of data set
	"1"	- download
	"2"	- upload
	"3"	- delete data set
06..17	-A12-	data set id. no.

#### **Telegram 121:           TRANSFER STATUS**

Byte	cont.	Description
05	-N01-	transfer status
	"0"	- transfer not possible
	"1"	- transfer possible
	"2"	- Id-No. not available

#### **Telegram 122:           UPLOAD BLOCK OF DATA**

Byte	cont.	Description
05..08	-N04-	block no. (0000 = first block)
09..44	-B36-	data-block (binary data if required)

#### **Telegram 123:           END OF UPLOAD TRANSFER**

Byte	cont.	Description
05..08	-N04-	block no. (last block sent + 1)

#### **Telegram 124:           TRANSFER ACKNOWLEDGEMENT**

Byte	cont.	Description
05	-N01-	Transfer acknowledgement
	"1"	- positive

#### **Telegram 125:           REQUEST FOR NEXT DATA BLOCK**

Byte	cont.	Description
05..08	-N04-	next expected data block-no.

## 4. Communication Flow

### 4.1 Upload of Data Set Initiated by Central Computer

"003" (optional)		- request for job definition
"103" (optional)		- job definition
"021"+"2"+id.no.		- upload request
"121"+"1"		- positive acknowledgement
"025"+"0000"		- start of the transfer by requesting first data block
"122"+"0000"+data		- first data block
.		
.		
"025"+block no. (next)		- continue upload transfer by requesting next data block
"122"+block no. +data		- next data block
"025"+block no.		- continue upload transfer by requesting next data block
"123"+block no. (=last+1)		- end of upload transfer request

Remark: If the central computer receives "121" with "0" or "2", no upload of data takes place.

### 4.2 Download of Data Set Initiated by Central Computer

"021"+"1"+id.no.		- download request
"121"+"1"		- positive acknowledgement
"022"+"0000"+data		- first data block
"125"+block no. (next)		- request for next data block transmission and next block no.
.		
.		
"022"+block no. +data		- next data block

"125"+block no.  
(next) | - request for next data block

"023"+block no.  
(=last+1) | - end of download transfer

"124"+"1" | - positive acknowledgement

Remark: If the central computer receives "121" with "0" or "2",  
no download of data takes place.

#### 4.3 Upload of Data Set Initiated by Machine Controller

"000" | - standard question

"100"+"020" | - standard answer with request  
for data set transfer

"020" | - request for transfer specification

"120"+"2"+id.no. | - transfer specification

"025"+"0000" | - start of the transfer by requesting  
first data block

"122"+"0000"+data | - first data block

.  
.  
.

"025"+block no.  
(next) | - continue transfer by requesting next  
data block

"122"+block no.  
+data | - next data block

"025"+block no.  
(next) | - continue transfer by requesting next  
data block

"123"+block no.  
(last+1) | - end of upload transfer request

"024"+"1" | - positive acknowledgement

"124"+"1" | - positive acknowledgement

#### 4.4 Download of Data Set Initiated by Machine Controller

"000"	- standard question
"100"+"020"	- standard answer with request for data set transfer
"020"	- request for transfer specification
"120"+"1"+id.no.	- transfer specification
"022"+"0000"+data	- first data block
"125"+block no. (next)	- request for next data block transmission
.	
.	
.	
"022"+block no. +data	- next data block
"125"+block no. (next)	- request for next data block transmission
"023"+block no. (last+1)	- end of download transfer
"124"+"1"	- positive acknowledgement

#### 4.5 Check Existence of Data Set

"000"	- standard question
"100"+"020"	- standard answer with request for data set transfer
"020"	- request for transfer specification
"120"+"0"+id.no.	- transfer specification
"024"+ status	- acknowledgement "2" = Id-No. not available "3" = Id-No. in use
"124"+"1"	- positive acknowledgement

#### 4.6 Delete Data Set

"000"		- standard question
"100"+"020"		- standard answer with request for data set transfer
"020"		- request for transfer specification
"120"+"3"+id.no.		- transfer specification
"024"+"1"		- positive acknowledgement
"124"+"1"		- positive acknowledgement

#### 4.7 Error Detection

If the sequence of telegrams is not as specified, then the telegrams "096" or "196" must be used and the transfer can be cancelled.

If the slave receives telegram "020" although it did not send a standard answer "100"+"020", it will send "196".

If the block-no. is not in sequence (same block-no. as before or next one), then the telegrams "097" or "197" with parameter byte 05 = "2" must be used and the transfer can be retried or cancelled.



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