This recommendation was prepared by the Technical Commission of EUROMAP.

Supplier’s data corrected (v. 1.0a).

Further supplier added (v. 1.1)

List of plug suppliers removed (v. 1.2).
Please visit www.euromap.org/technical-issues/technical-recommendations for the current list.

Schematic drawing of the interface corrected (v. 1.3).
**Content**

1. **Scope and Application** ................................................................. 3

2. **Description** ................................................................................... 3

   2.1 **Plug and socket outlets** .............................................................. 3

   2.2 **Contact specification** .................................................................. 4
      2.2.1 **Signals** .................................................................................. 4
      2.2.2 **Reference potential** ............................................................... 4

   2.3 **Plug contact assignment** .............................................................. 4
      2.3.1 **Table 1: Plug on the injection moulding machine (male)** ... 5
      2.3.2 **Table 2: Plug on the injection moulding machine (female)** ... 6
      2.3.3 **Time diagram Option 2** ....................................................... 7

   2.4 **Sources of supply** ........................................................................ 7

   2.5 **Schematic drawing of the interface** ............................................. 8
1 Scope and Application

This EUROMAP recommendation defines the connection between the injection moulding machine (IMM) and an external servo drive or frequency converter of electrically driven cores. For all other movements inside the mould EUROMAP 74 can be applied as well, however the corresponding movements equivalent to “core retract” and “core move in” have to be defined.

In addition, recommendations are given for signal voltage and current levels.

2 Description

The signals in both the injection moulding machine and the external servo drive or frequency converter of electrically driven cores are given by contacts, e.g. contacts of relays or switches, semiconductors, etc. The contact making is either potential-free or related to a reference potential supplied to a contact of the plug mounted on the injection moulding machine or the external servo drive or frequency converter of the electrically driven cores (see Tables 1 and 2).

Limit or proximity switches of core pullers shall be wired according to EUROMAP 13.

All signals which are not optional shall be supported by injection moulding machines.

2.1 Plug and socket outlets

The connection between the injection moulding machine and the external servo drive or frequency converter is achieved by the plugs specified below. All the plug contacts should be capable of taking a minimum of 250 V and 6 A.

Arrangements of pins and sockets viewed from the mating side (opposite the wiring side).
2.2 Contact specification

2.2.1 Signals
- These signals shall be in accordance with clause 3.3.1 of EN 61131-2, Table 9, Type 2 or with clause 3.3.3 of EN 61131-2, Table 11, 0,1 A max.

2.2.2 Reference potential
- Voltage 18 – 36V DC
- Overlayed ripple max. 2,5Vpp
- Withstand against overvoltage up to 60V min. 10 ms
- Current max. 2A

2.3 Plug contact assignment

Notes on the tables below:
- All signals are continuous signals unless otherwise noted.
- The signals are conducted from the signal source to the respective pin.
### 2.3.1 Table 1: Plug on the injection moulding machine (male)

<table>
<thead>
<tr>
<th>Contact No. (male), see fig. 2</th>
<th>Signal designation</th>
<th>Description</th>
<th>Signal designation for optional second interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>a1/a2</td>
<td>Enable core 1 movements</td>
<td>The switch contact must be closed when the injection moulding machine emergency stop device (see EN 60204-1) is being not actuated and/or the safety devices (see EN201) (e.g. safety guards, footboard safety, etc.) on the injection moulding machine are operative, so that dangerous movements of the electrically driven cores are possible.</td>
<td>Enable core 3 movements</td>
</tr>
<tr>
<td>a3/a4</td>
<td>Enable core 2 movements</td>
<td>The switch contact must be closed when the injection moulding machine emergency stop device (see EN 60204-1) is being not actuated and/or the safety devices (see EN201) (e.g. safety guards, footboard safety, etc.) on the injection moulding machine are operative, so that dangerous movements of the electrically driven cores are possible.</td>
<td>Enable core 4 movements</td>
</tr>
</tbody>
</table>
| a5                            | Core 1 speed bit 1 | Speed control for core 1  
Signal pin a5: "high": fast  
Signal pin a5: "low": slow  
Signal pin a6: "high": Profile 2  
Signal pin a6: "low": Profile 1 | Core 3 speed bit 1 |
| a6                            | Core 1 speed bit 2 | Speed control for core 2  
Signal pin a7: "high": fast  
Signal pin a7: "low": slow  
Signal pin a8: "high": Profile 2  
Signal pin a8: "low": Profile 1 | Core 3 speed bit 2 |
| a7                            | Core 2 speed bit 1 | Speed control for core 2  
Signal pin a7: "high": fast  
Signal pin a7: "low": slow  
Signal pin a8: "high": Profile 2  
Signal pin a8: "low": Profile 1 | Core 4 speed bit 1 |
| a8                            | Core 2 speed bit 2 | Speed control for core 2  
Signal pin a7: "high": fast  
Signal pin a7: "low": slow  
Signal pin a8: "high": Profile 2  
Signal pin a8: "low": Profile 1 | Core 4 speed bit 2 |
| a9                            | Slow speed open guards | Slow speed open guards for all cores  
Signal: "high" activates slow speed (EN 201) when enable contact is closed. | identical |
| a10-a11                      | Spare | Not fixed by EUROMAP, manufacturer dependent. | Spare |
| a12                           | Supply from external device | (reference potential 24V DC/2A) | Supply from external device |
| d1 OPTION 1                  | Request Stop movements | A request-signal to stop movements of all cores.  
Signal: NO.  
Contact release with safety guard open | identical |
| d2 OPTION 2                  | Request reference run core 1 | A rising edge of this signal indicates a request for reference run of core 1  
The signal has to be present during the reference run.  
A falling edge during reference run stops the reference run of core 1  
Signal: NO | Request reference run core 3 |
| d3 OPTION 2                  | Request reference run core 2 | A rising edge of this signal indicates a request for reference run of core 2  
The signal has to be present during the reference run.  
A falling edge during reference run stops the reference run of core 2  
Signal: NO | Request reference run core 4 |
| d4                            | core 1 retract | Signal to retract core 1. | core 3 retract |
| d5                            | core 1 move in | Signal core 1 to move in | core 3 move in |
| d6                            | core 2 retract | Signal to retract core 2. | core 4 retract |
### Contact No. (male), see fig. 2

<table>
<thead>
<tr>
<th>Signal designation</th>
<th>Description</th>
<th>Signal designation for optional second Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>d7</td>
<td>core 2 move in</td>
<td>core 4 move in</td>
</tr>
<tr>
<td>d8-d11</td>
<td>Spare</td>
<td>Reserved for future use of EUROMAP</td>
</tr>
<tr>
<td>d12</td>
<td>Supply from external device</td>
<td>Supply from external device</td>
</tr>
</tbody>
</table>

NO: normally open or low with standstill  
NC: normally closed or high with standstill  
Identical: exactly the same signal as the first interface.

Option 1: Safety guard open request with standstill feedback when achieved  
Option 2: Request for reference run and get feedback when reference achieved. For core puller systems where the two cores have collision regions and need to be interlocked, each core needs an own request for reference run.  
Optional a second Interface is possible to implement 4 electrically driven cores, the intention is to allow an Interface on the fix platen and one on the movable platen without cabling directly between these two Interfaces (fix platen to movable platen)

#### 2.3.2 Table 2: Plug on the injection moulding machine (female)

<table>
<thead>
<tr>
<th>Contact No (female), see fig. 2</th>
<th>Signal designation</th>
<th>Description</th>
<th>Signal designation for optional second Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>b1/b2</td>
<td>Supply from injection moulding machine</td>
<td>24V DC / 2A (reference potential)</td>
<td>identical</td>
</tr>
<tr>
<td>b3/b4</td>
<td>Supply from injection moulding machine</td>
<td>0V (reference potential)</td>
<td>identical</td>
</tr>
<tr>
<td>b5</td>
<td>Core system ready (core 1 and core 2)</td>
<td>Signal from core system. If ready for operation, signal is high</td>
<td>Core system ready (core 3 and core 4)</td>
</tr>
<tr>
<td>b6 OPTION 1</td>
<td>Standstill achieved of core 1</td>
<td>Movement of core 1 stopped, the switch contact is closed and signal goes high. Signal goes low when &quot;enable core 1 movements&quot;</td>
<td>Standstill achieved of core 3</td>
</tr>
<tr>
<td>b7 OPTION 1</td>
<td>Standstill achieved of core 2</td>
<td>Movement of core 2 stopped, the switch contact is closed and signal goes high. Signal goes low when &quot;enable core 2 movements&quot;</td>
<td>Standstill achieved of core 4</td>
</tr>
<tr>
<td>b8 OPTION 2</td>
<td>Reference valid for core 1</td>
<td>HIGH-Signal indicates that the reference of the drive for core 1 is valid. During the reference run the signal has to be LOW.</td>
<td>Reference valid for core 3</td>
</tr>
<tr>
<td>b9 OPTION 2</td>
<td>Reference valid for core 2</td>
<td>HIGH-Signal indicates that the reference of the drive for core 2 is valid. During the reference run the signal has to be LOW.</td>
<td>Reference valid for core 4</td>
</tr>
<tr>
<td>b10 OPTION 1</td>
<td>Confirmation save switch off of core 1</td>
<td>The switch contact must be closed or the signal must be high, when save switch off of core 1 is confirmed (see EN201 appendix E signal 2.0), so that no dangerous movement of the electrically driven core is possible.</td>
<td>Confirmation save switch off of core 3</td>
</tr>
<tr>
<td>b11 OPTION 1</td>
<td>Confirmation save switch off of core 2</td>
<td>The switch contact must be closed or the signal must be high, when save switch off of core 2 is confirmed (see EN201 appendix E signal 2.0), so that no dangerous movement of the electrically driven core is possible.</td>
<td>Confirmation save switch off of core 4</td>
</tr>
</tbody>
</table>
## 2.3.3 Time diagram Option 2

Table 1/d1: Request Stop movements

Table 2/(b6/b7): Standstill achieved

Table 1/(a1/a2;a3/a4): Enable core 1 and 2 movements

Table 1/(b10/b11): Feedback safety shutdown

### 2.4 Sources of supply

A list of plug suppliers is available for download on the EUROMAP website:
[www.euromap.org/technical-issues/technical-recommendations](http://www.euromap.org/technical-issues/technical-recommendations)
2.5 Schematic drawing of the interface

- Enable core movements 1
- Enable core movements 2
- Core 1 speed bit 1
- Core 1 speed bit 2
- Core 2 speed bit 1
- Core 2 speed bit 2
- Slow speed open guards
- Supply from external device 24 V
- OPTION 1
- Request: Stop movements
- OPTION 1
- OPTION 2
- Request: reference run core 1
- OPTION 2
- OPTION 2
- Core 1 retract
- Core 2 retract
- Core 1 move in
- Core 2 move in

- Supply from injection moulding machine 24 V
- Option 1
- DI
- Supply from injection moulding machine 0 V
- Option 1
- DI
- Core system ready (core 1 and core 2)
- Standstill achieved of core 1
- Reference valid for core 1
- Reference valid for core 1
- Confirmation save switch off core 1
- Confirmation save switch off core 2
- Option 1
- Option 1
- Option 1
- Option 1
- Option 1
- Option 1
- Option 1
- Option 1
- Option 1
EUROMAP

Europäisches Komitee der Hersteller von Kunststoff- und Gummimaschinen

European Committee of Machinery Manufacturers for the Plastics and Rubber Industries

Comité Européen des Constructeurs de Machines pour Plastiques et Caoutchouc

Comitato Europeo Costruttori Macchine per Materie Plastiche e Gomma

See you again

http://www.euromap.org