EUROMAP 74

Electrical Interface between Injection Moulding Machines and Electrically Driven Cores

Version 1.3, June 2020
(9 pages)

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 Page

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).

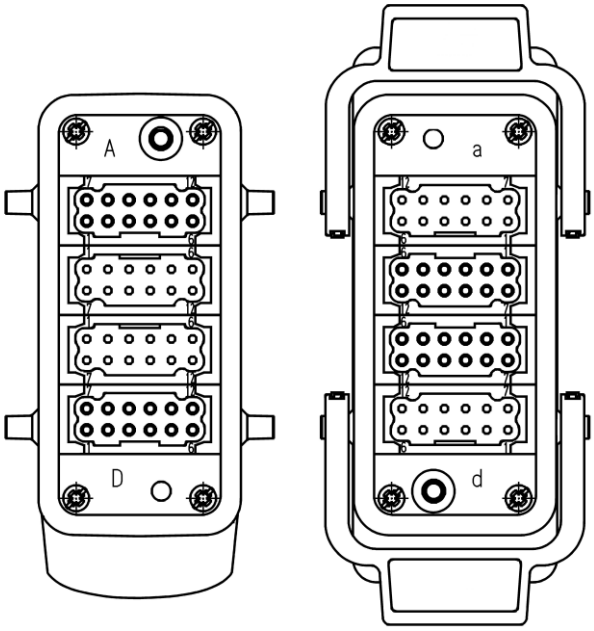


Figure 1: Plug on the external servo drive or frequency converter

Figure 2: Plug on the injection moulding machine

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)

Contact No. (male), see fig. 2	**Signal designation**	**Description**	**Signal designation for optional second Interface**
a1/a2	Enable core 1 movements	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.	Enable core 3 movements
a3/a4	Enable core 2 movements	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.	Enable core 4 movements
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		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		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	Signal designation	Description	Signal designation for optional second Interface
d7	core 2 move in	Signal core 2 to move in	core 4 move in
d8-d11	Spare	Reserved for future use of EUROMAP	Spare
d12	Supply from external device	(reference potential 0V)	Supply from external device

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

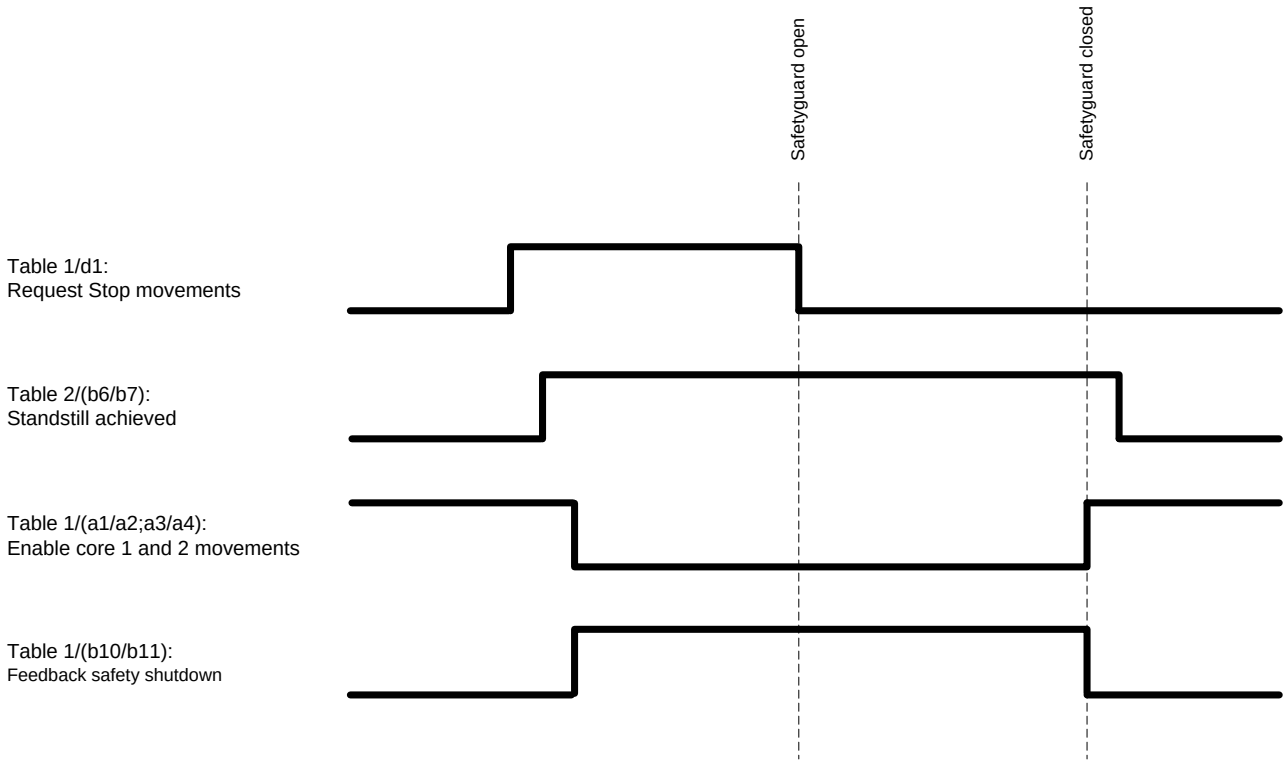
Option 1: Safety guard open request with standstill feedback when achieved
Option 2: Request for reference run and get feedback when reference achieved. For core puller systems where the two cores have collision regions and need to be interlocked, each core needs an own request for reference run.
Optional 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)

Contact No (female), see fig. 2	Signal designation	Description	Signal designation for optional second Interface
b1/b2	Supply from injection moulding machine	24V DC / 2A (reference potential)	identical
b3/b4	Supply from injection moulding machine	0V (reference potential)	identical
b5	Core system ready (core 1 and core 2)	Signal from core system. If ready for operation, signal is high	Core system ready (core 3 and core 4)
b6 **OPTION 1**	Standstill achieved of core 1	Movement of core 1 stopped, the switch contact is closed and signal goes high. Signal goes low when “enable core 1 movements”	Standstill achieved of core 3
b7 **OPTION 1**	Standstill achieved of core 2	Movement of core 2 stopped, the switch contact is closed and signal goes high. Signal goes low when “enable core 2 movements”	Standstill achieved of core 4
b8 **OPTION 2**	Reference valid for core 1	HIGH-Signal indicates that the reference of the drive for core 1 is valid. During the reference run the signal has to be LOW.	Reference valid for core 3
b9 **OPTION 2**	Reference valid for core 2	HIGH-Signal indicates that the reference of the drive for core 2 is valid. During the reference run the signal has to be LOW.	Reference valid for core 4
b10 **OPTION 1**	Confirmation save switch off of core 1	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.	Confirmation save switch off of core 3
b11 **OPTION 1**	Confirmation save switch off of core 2	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.	Confirmation save switch off of core 4

Contact No (female), see fig. 2	Signal designation	Description	Signal designation for optional second Interface
b12	Spare	Reserved for future use of EUROMAP.	Spare
c1-c6	Spare	Reserved for future use of EUROMAP.	Spare
c7-c12	Spare	Not fixed by EUROMAP, manufacturer dependent.	Spare

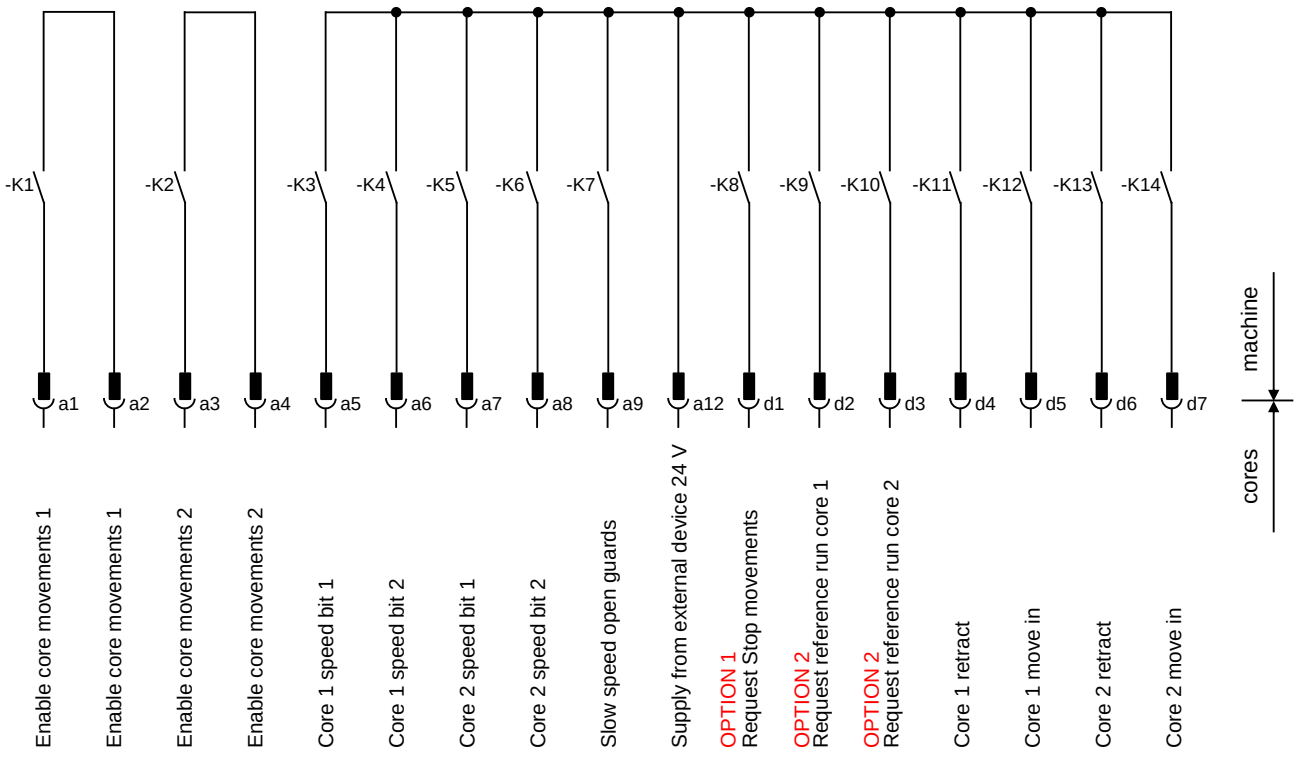
2.3.3 Time diagram Option 2

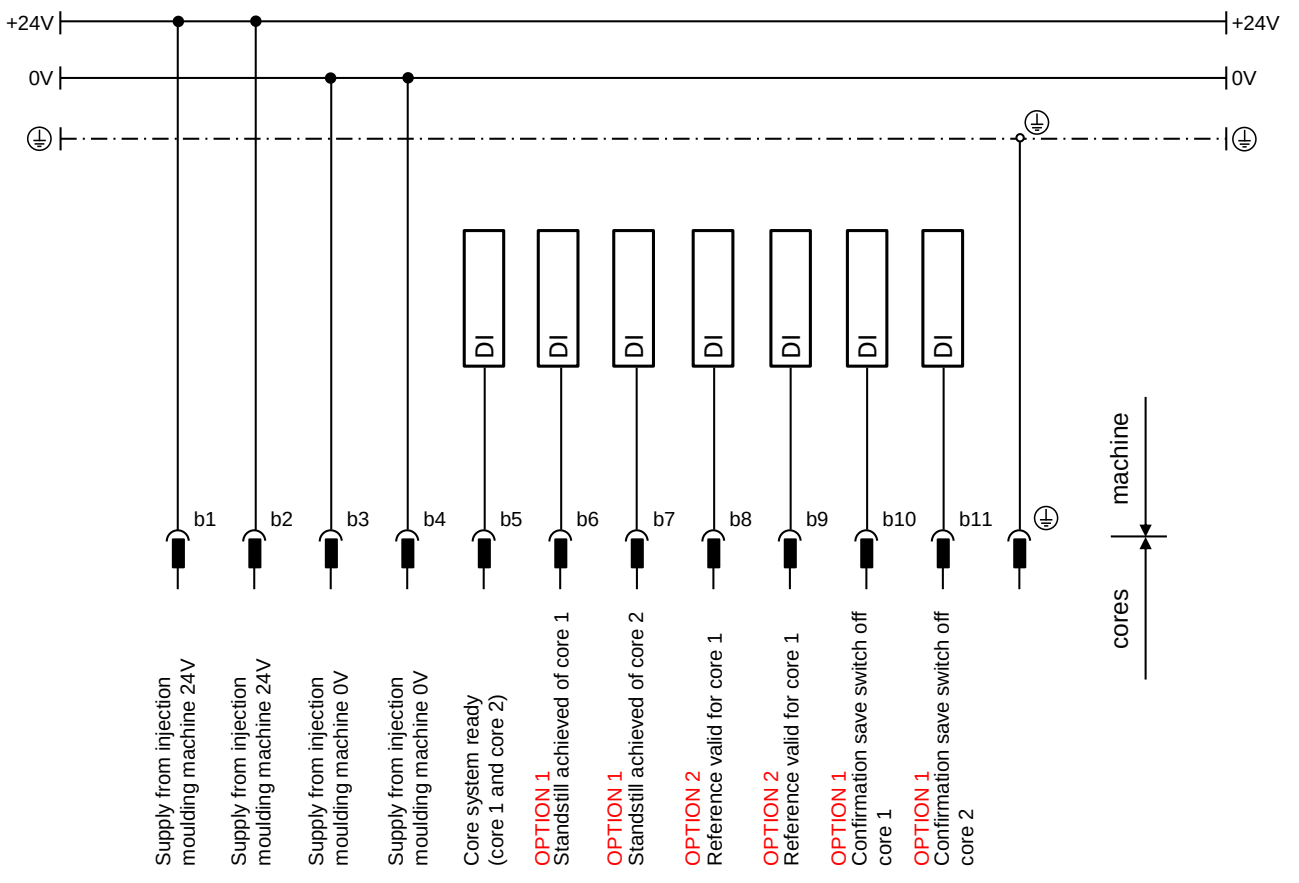


2.4 Sources of supply

A list of plug suppliers is available for download on the EUROMAP website:
www.euromap.org/technical-issues/technical-recommendations

2.5 Schematic drawing of the interface





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