

# Thermal and thermal transfer printers

Wirings and parameters for I/O signals

Rev.5

## Revisions table

Version	Date	Revision description
Rev.0	22/11/2019	
Rev.1	07/03/2022	Updated graphics, added PLC example
Rev.2	19/06/2023	Updated graphics
Rev.3	13/11/2023	Updated "Control unit without expansion - internal power supply and ground" paragraph
Rev.4	29/08/2025	Added I/O signals diagrams
Rev.5	21/11/2025	Updated schematics

## SUMMARY

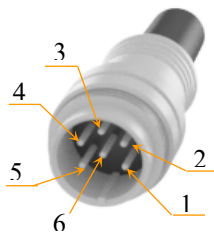
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# 1 Wiring and parameters for I/O signals - 6 poles DIN connector

The Pick & Place working mode allows an external device (e.g. PLC, photocell, pneumatic applicator, etc.) to start or halt printing. When Pick & Place options is enabled 3 optoisolated signals are available:

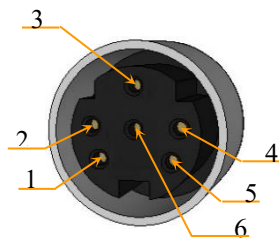
- START PRINT                      **Input** - print consent
- PRINT END                        **Output** - print end signal
- ALARM                              **Output** - auxiliary output for error conditions

These 3 signals are mapped on a 6 poles DIN plug with the following outline:



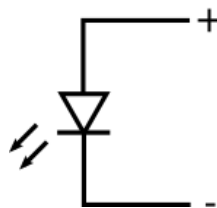
6 poles DIN connector (external view)

The I/O signals needed to synchronize the printing system with external devices, connected on the 6 poles DIN socket of the control unit, are all optoisolated. Depending on whether it's an input or an output signal, this will be connected at the positive pole of the diode or the transistor respectively.

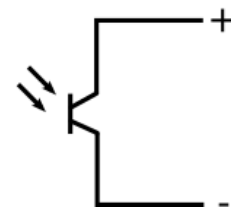


6 poles DIN socket (external front view)

equivalent input

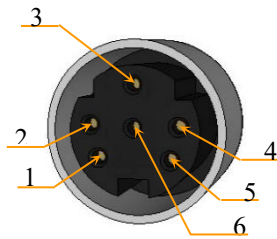


equivalent output



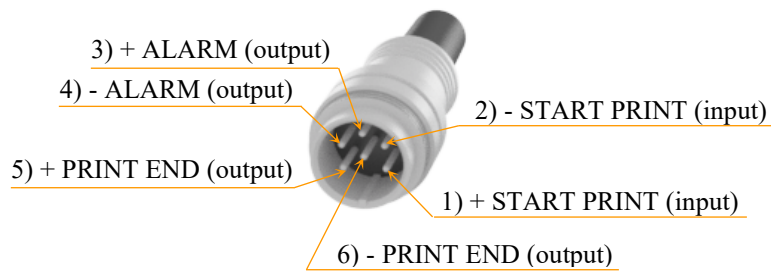
## Control unit without expansion - external power supply and ground

The pinout of a 6 poles DIN socket of a control unit without expansion and with external power supply and ground is shown below.

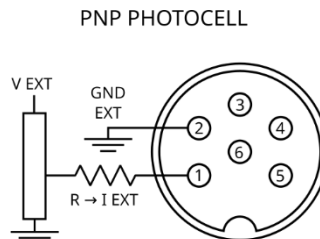
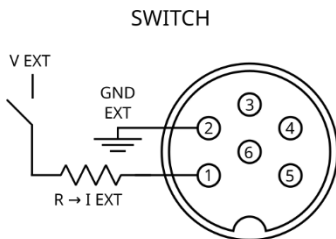


1	+ START PRINT (INPUT)
2	- START PRINT (INPUT)
3	+ ALARM (OUTPUT)
4	- ALARM (OUTPUT)
5	+ PRINT END (OUTPUT)
6	- PRINT END (OUTPUT)

The pinout of the 6 poles DIN plug used to connect to the control unit is shown below. The examples refer to the connection with a DIN plug seen from the welding side.



### Start print signal (START PRINT)

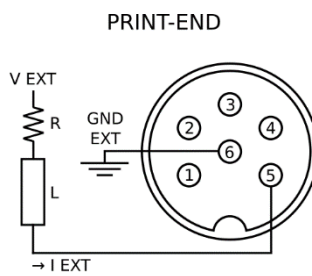
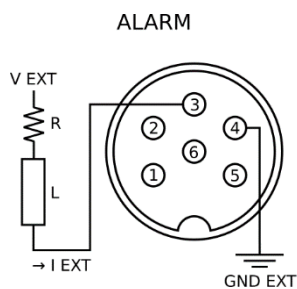


Vext (Volt)	Iext (mA)	R (Ohm)
24	15	1270
24	30	470
24	50	150
12	15	470
12	30	70
5	15	0

Vext = external power supply voltage  
Iext = current generated by the external circuit  
R = resistance of the external circuit

NOTE: the highlighted rows indicate the recommended values

### Alarm signal (ALARM) and print end signal (PRINT END)

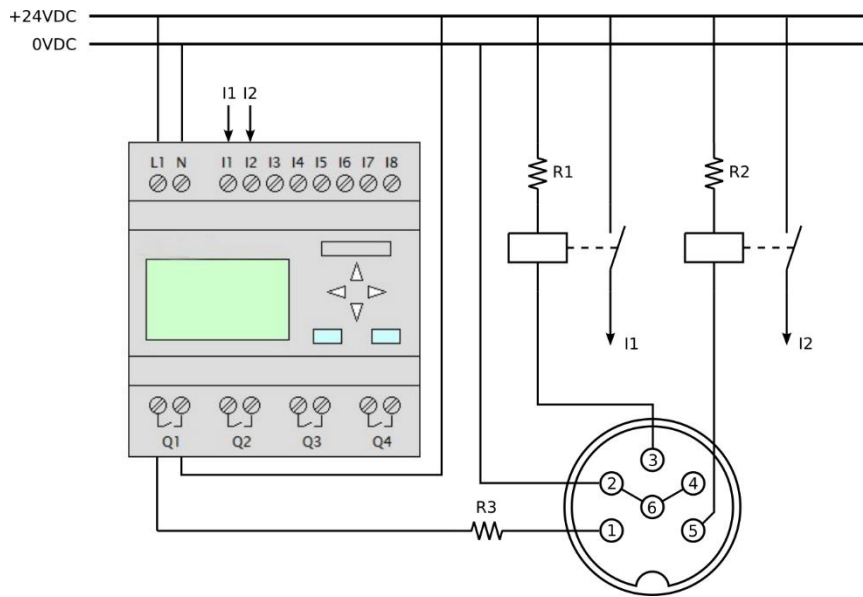


Vext (Volt)	Iext (mA)	R+L (Ohm)
24	10	2400
24	20	1200
24	50	240
12	10	1200
12	20	600
12	50	120
5	10	500
5	20	250
5	50	100

Vext = external power supply voltage  
Iext = current generated by the external circuit  
R = current limiting resistor  
L = load resistance of the external circuit

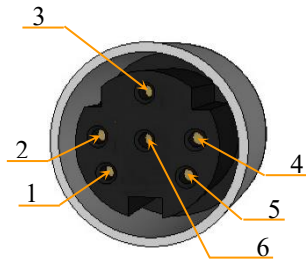
NOTE: the highlighted rows indicate the recommended values

## Application example with PLC



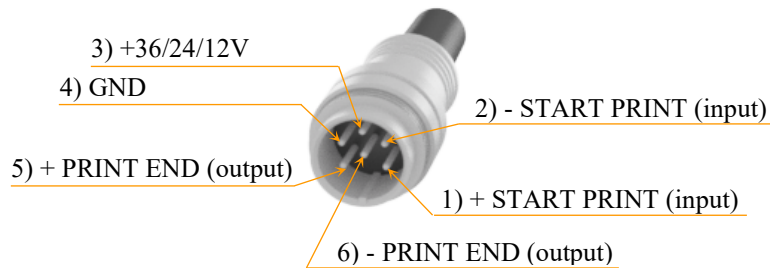
## Control unit without expansion - internal power supply and ground

The pinout of a 6 poles DIN socket of a control unit without expansion and with internal power supply and ground is shown below.

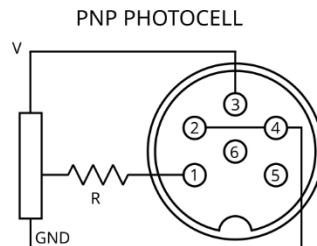
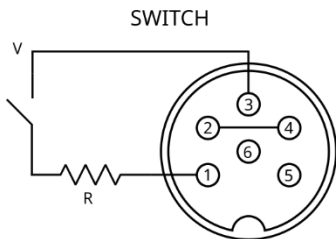


1	+ START PRINT (INPUT)
2	- START PRINT (INPUT)
3	+ 36/24/12 V
4	GND
5	+ PRINT END (OUTPUT)
6	- PRINT END (OUTPUT)

The pinout of the 6 poles DIN plug used to connect to the control unit is shown below. The examples refer to the connection with a DIN plug seen from the welding side.



### Start print signal (START PRINT)



V (Volt)	I (mA)	R (Ohm)
36	15	2000
24	15	1270
24	30	470
24	50	150
12	15	470
12	30	70

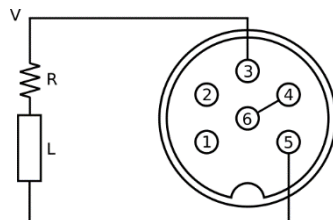
V = internal power supply voltage

I = generated current

R = resistance of the external circuit

NOTE: the highlighted rows indicate the recommended values

### Print end signal (PRINT END) - the alarm signal is not available



V (Volt)	I (mA)	R+L (Ohm)
36	20	1800
24	10	2400
24	20	1200
24	50	240
12	10	1200
12	20	600
12	50	120

V = internal power supply voltage

I = generated current

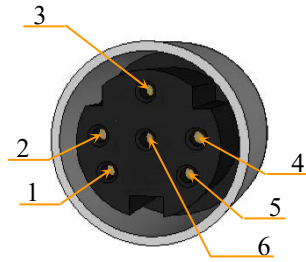
R = current limiting resistor

L = load resistance of the external circuit

NOTE: the highlighted rows indicate the recommended values

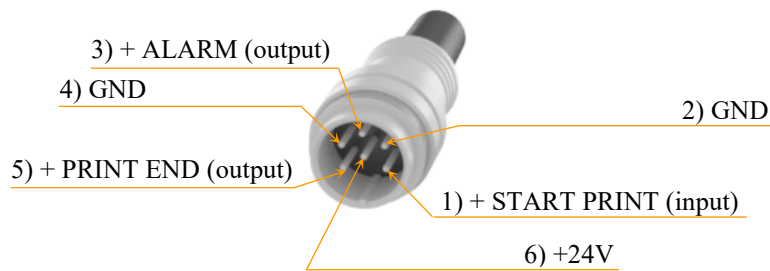
## Control unit with expansion - internal +24V power supply and ground

The pinout of a 6 poles DIN socket of a control unit with expansion and with internal +24V power supply and ground is shown below.

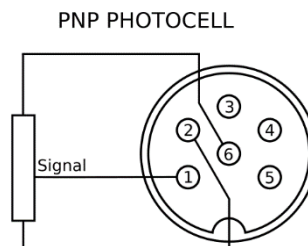
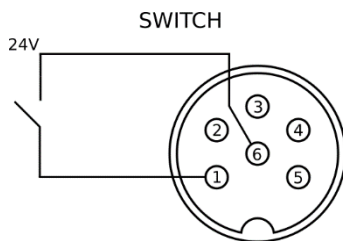


1	+ START PRINT (INPUT)
2	GND
3	+ ALARM (OUTPUT)
4	GND
5	+ PRINT END (OUTPUT)
6	+24V

The pinout of the 6 poles DIN plug used to connect to the control unit is shown below. The examples refer to the connection with a DIN plug seen from the welding side.

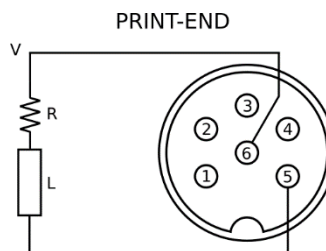
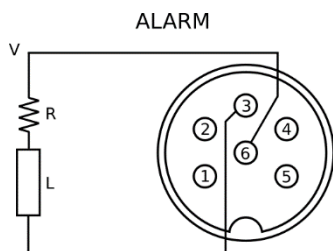


### Start print signal (START PRINT)



The internal circuit resistance in 1800 Ohm

### Alarm signal (ALARM) and print end signal (PRINT END)



V (Volt)	I (mA)	R+L (Ohm)
24	10	2400
24	20	1200
24	50	240

V = internal power supply voltage

I = generated current

R = current limiting resistor

L = load resistance of the external circuit

NOTE: the highlighted rows indicate the recommended values

V = internal +24V

The transistor can output a maximum current of 1A

$I = V/(R+L)$

with  $I_{max} = 1A$

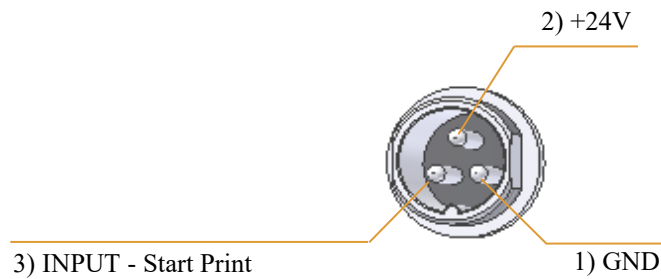
## 2 Wiring and parameters for I/O signals - 3, 4 and 5 poles connectors

The Pick & Place working mode allows an external device (e.g. PLC, photocell, pneumatic applicator, etc.) to start or halt printing. When Pick & Place options is enabled 3 optoisolated signals are available:

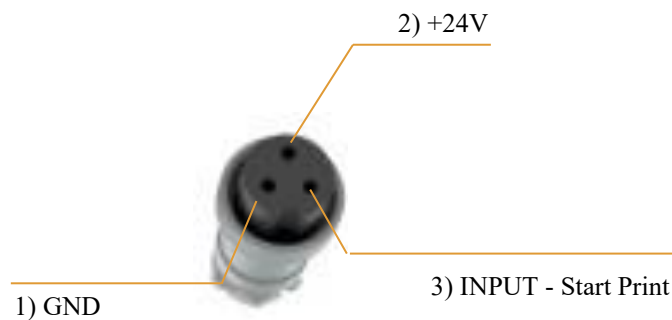
- START PRINT                      **Input** - print consent
- PRINT END                        **Output** - print end signal
- ALARM                              **Output** - auxiliary output for error conditions

These 3 signals can be found, on control units with expansion, internal +24V power supply and ground, on the 6 poles DIN socket as well as on the 3 other connectors.

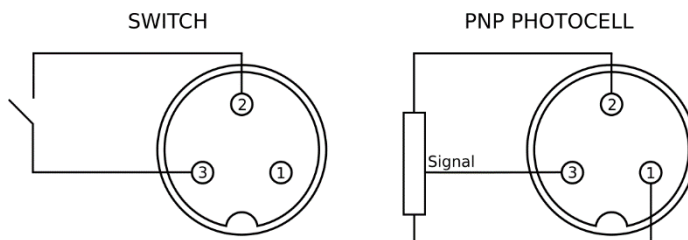
### 3 poles connector - Start Print



3 poles socket - Start



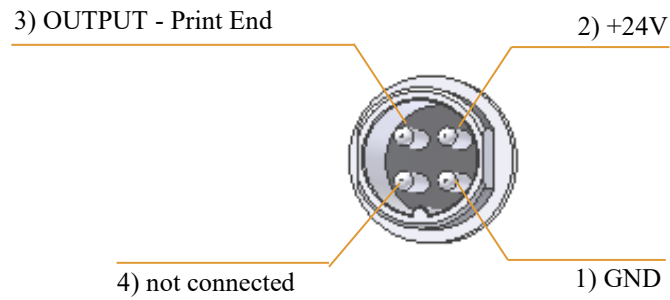
3 poles plug - Start Print



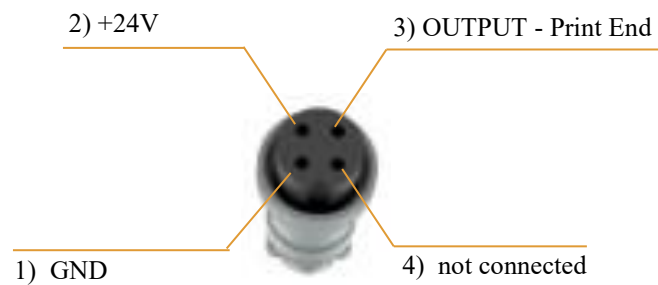
Welding side view

Input signal  
The internal circuit resistance is 1800 Ohm.

## 4 poles connector - Print End

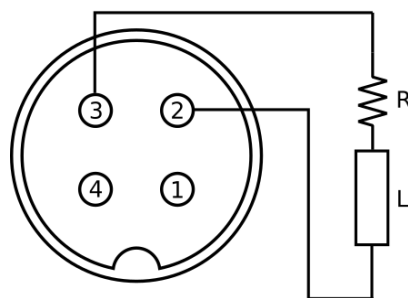


4 poles socket - Print End



4 poles plug - Print End

### PRINT-END



Welding side view

V (V)	I (mA)	R (Ohm)
24	15	1270
24	30	470
24	50	150

#### Output signals

V = internal power supply voltage

I = generated current

R = current limiting resistor

L = load resistance of the external circuit

NOTE: the highlighted rows indicate the recommended values

V = internal +24V

The transistor can output a maximum current of 1A

$I = V/(R+L)$

with  $I_{max} = 1A$

## 5 poles connector - Alarm

3) OUTPUT - Alarm

4) not connected

2) +24V



5) not connected

1) GND

5 poles socket - Alarm

3) OUTPUT - Alarm

2) +24V

4) not connected

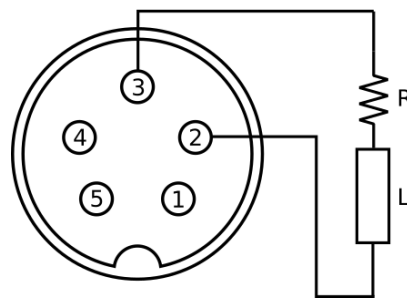


1) GND

5) not connected

5 poles plug - Alarm

### ALARM



Welding side view

V (V)	I (mA)	R (Ohm)
24	15	1270
24	30	470
24	50	150

Output signals

V = internal power supply voltage

I = generated current

R = current limiting resistor

L = load resistance of the external circuit

NOTE: the highlighted rows indicate the recommended values

V = internal +24V

The transistor can output a maximum current of 1A

$I = V/(R+L)$

with  $I_{max} = 1A$

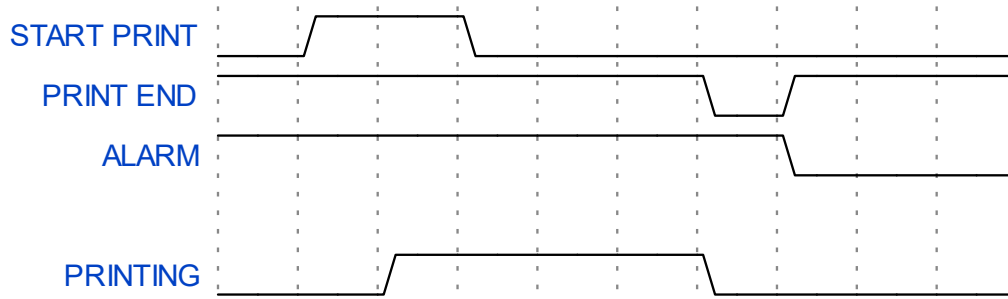
### 3 I/O signals diagrams

Printing without software command

StartPrint Mode = Command

StartPrint Time > 0 cs

The printing starts after the START PRINT signal has been active for a time equal to "StartPrint Time".



Printing without software command

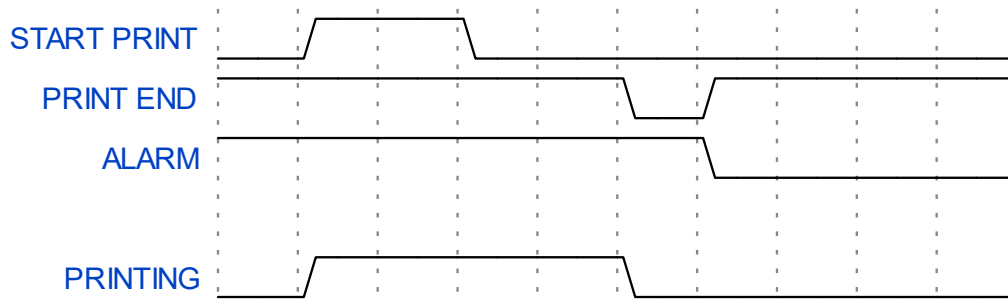
StartPrint Mode = Command

StartPrint Time = 0 cs

The printing starts as soon as the START PRINT signal is enabled.

The logic is based on the signal level, not the signal front.

An always active START PRINT signal will cause a continuous printing of labels.

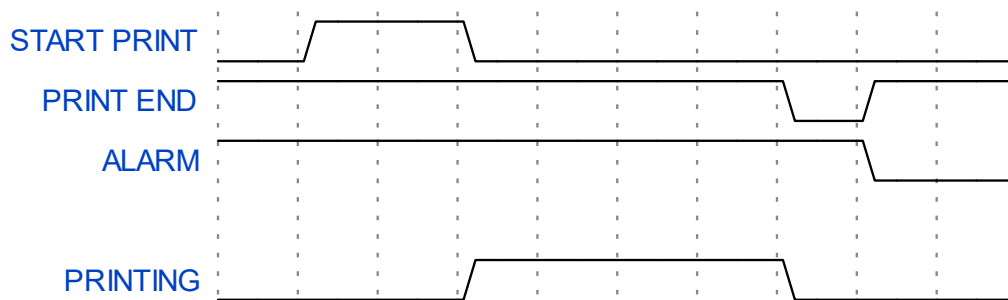


Printing with software command

StartPrint Mode = Consent

StartPrint Time > 0 cs

The printing starts after the START PRINT signal has been deactivated after being active for a time greater or equal to "StartPrint Time".



Printing with software command

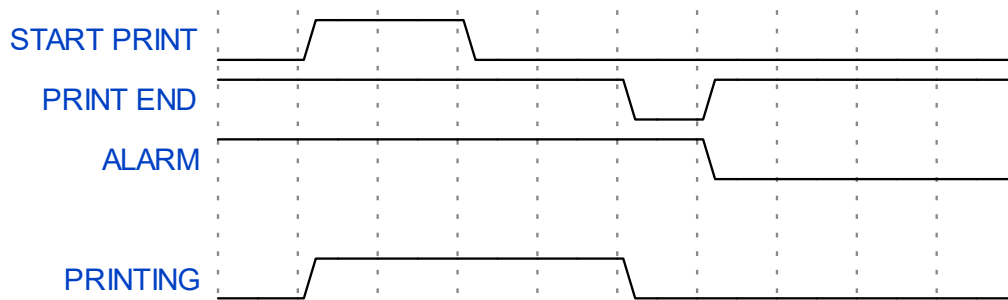
StartPrint Mode = Consent

StartPrint Time = 0 cs

The printing starts as soon as the START PRINT signal is enabled.

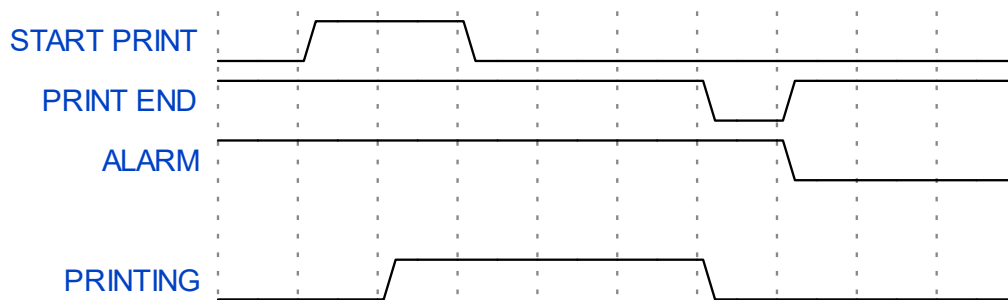
The logic is based on the signal level, not the signal front.

An always active START PRINT signal will cause a continuous printing of labels until the printing batch is finished.



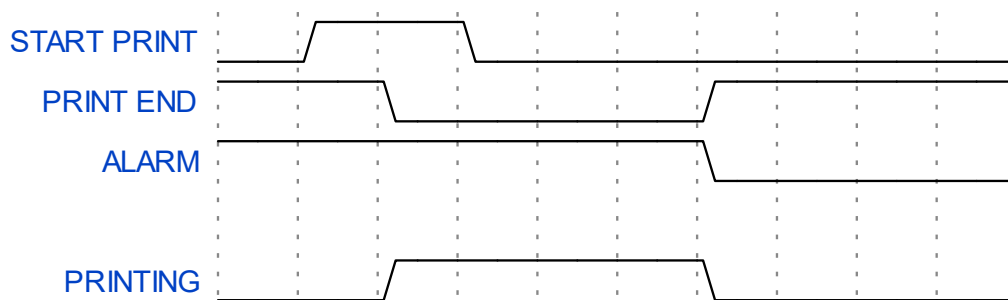
Print-End Signal > 0 cs

A pulse of duration "Print-End Signal" is generated after printing.



Print-End Signal = While printing

The signal remains active during printing.



All the diagrams show the signals with their default polarity settings:

StartPrint Level = Standard (HIGH)

Print-End Level = Standard (LOW)

AlarmSign. Level = Standard (LOW)

The alarm signal gets activated at the end of printing to indicate a paper end or ribbon end condition.