iPAK to iPAK2 conversion guide

A guide to converting existing iPAK installations to use the iPAK2 and iPAK2v2 controls.

Document change record

19/10/20	Initial release

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1. Introduction

The original iPAK was first produced in 2005 but by 2018 it had become impossible to source suitable components. The iPAK2 was designed as a new control, but retains the form-factor of the iPAK and is suitable for use as a replacement in most instances.

This document is intended to act as a guide for users wishing to convert an existing iPAK installation to work with an iPAK2. All comments apply equally to the iPAK2 and the later iPAK2v2, except where noted.

As each connection is discussed in detail, section by section, please also refer to the diagrams in section 11.

Although most common situations are covered here, please contact the factory if you require further assistance: contact details may be found on the last page.

2. Mechanical considerations

The iPAK2 CPU has the same footprint as the original iPAK and is mechanically a drop-in replacement. It is compatible with the original iPAK inverters.

3. Connection to the inverter

The iPAK2 CPU may be connected to an existing iPAK inverter via the original 26-way ribbon cable.

4. Discrete Inputs and Outputs (I/O)

Also see section 11.

4.1. System connector (P1)

The 6-way plug-in terminal block P1 is compatible. However, it is recommended that the external wiring between the STOP, START and WELD ON switches is rearranged. Please compare the detail shown in section 11.

4.2. Inputs (P2)

Discrete inputs are made at connector P2. Both iPAK and iPAK2 use a 17-way plug-in terminal block. Most, but not all, signals are compatible. Not all connections may have been used. Please check the following table to see if any of the connections which are present are affected:

P2 terminal	Function (iPAK)	Function (iPAK2)
1	24V out (to switches)	24V out (to switches)
2	Start1	Start
3	Start2[1]	
4	Start3[1]	
5	Start4[1]	
6	Program select P1	Program select P1
7	Program select P2	Program select P2
8	Program select P4	Program select P4
9	Program select P8	Program select P8
10	Program select P16	Program select P16
11	Program select P32	Program select P32
12	Reset stepper	Reset stepper
13	Reset counter	Reset counter
14	Retract	Retract
15	Reset fault	Reset fault
16	2nd stage	2nd stage
17	Edit disable	Program select P64 /Edit enable

[1]These inputs are not available on iPAK2. Please consult the factory for advice if you were using these inputs.

4.3.   Outputs (P3)

Discrete inputs are made at connector P3. Both iPAK and iPAK2 use an 18-way plug-in terminal block. Most, but not all, signals are compatible. Not all connections may have been used. Please check the following table to see if any of the connections which are present are affected:

P3 terminal	Function (iPAK)	Function (iPAK2)
1	WAV	AV1[1]
2	Motor	AV2[1]
3		AV3[1]
4	HAV	HAV
5		
6	Counter	Counter
7	Stepper	Stepper
8	Prewarn	Prewarn
9	SCR BIT 1	AV4[1,2]
10	SCR BIT 2	AV5[1,2]
11	SCR BIT 4	AV6[1,2]
12	SCR BIT 8	AV7[1]
13		AV8[1]
14	EOS	EOS
15	Fault	Fault
16	Not ready	Ready[3]
17	Contactor	Contactor
18	0V	0V

[1] On iPAK2, the outputs AV1 to AV8 are programmable. If you are using the WAV or Motor signals on iPAK, these functions can be set up for each weld program on iPAK2 – see iPAK2 user guide.

[2] In multi-gun mode, the iPAK selects SCRs using these outputs. On iPAK2 this function can emulated by setting the *iPAK compatible* bit in the configuration – see iPAK2 user guide.

[3] iPAK2 outputs a READY signal, whereas iPAK outputs a NOT READY signal (i.e. the reverse sense). However, the sense of this output may be reversed by setting the *iPAK compatible* bit in the configuration – see iPAK2 user guide.

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5. Toroid

A Toroid (or Rogowski coil) can be used to measure the welding current. It is usually fitted to the secondary circuit of a welding machine or is sometimes built in to the welding transformer. iPAK and iPAK2 use different size plug-in connectors at P5. If your system makes use of a toroid, reconnect it as shown in the table below:

Function	iPAK P5 terminal	iPAK2 P5 terminal
Toroid	7	3
Toroid	8	4
Ground	9	5

6. Proportional Valve (PV)

iPAK and iPAK2 use different size plug-in connectors at P4. If your system makes use of a proportional valve, reconnect it as shown in the table below:

Function	iPAK P4 terminal	iPAK2 P4 terminal
24V supply in[1]	1	Not required
0V	2	2
Output 0..10V	3	3
Output 4..20 mA[2]	4	n/a
Input 0..10V	5	1
Input 4..20 mA[2]	6	n/a
Ground	8	4

[1] The 24V supply wiring is not required on iPAK2 and should be removed.

[2] 4..20 mA input and output are not available on iPAK2. If they are required, an external module should be used to convert these signals to 0..10V.

7. RS232 port

The RS232 ports on iPAK and iPAK2 are compatible. The original 10-way ribbon connector on the top left edge may be simply reconnected. The WSP3 programming pendant is compatible with both iPAK and iPAK2.

8. Sequencer

The original iPAK contained a sequencer feature which could be used to perform small scale PLC-like logic functions. There is no corresponding feature in the iPAK2. There are numerous micro-PLCs available which might be employed to fulfil this function.

9. Ethernet (TCP/IP)

On the original iPAK, Ethernet connectivity was provided through the use of a plug-in adapter card. Ethernet (TCP/IP) is built-in on iPAK2.

WS98-iPAK software is not compatible with iPAK2. Instead, please use Entron NetFlash programming software for your PC: this allows easy editing of all parameters in the iPAK2 plus numerous other functions. Please consult the factory for details.

10. EtherNet/IP

On the original iPAK, EtherNet/IP connectivity was provided through the use of a plug-in adapter card. EtherNet/IP requires a (different) plug-in adapter on iPAK2 but is built-in on iPAK2v2.
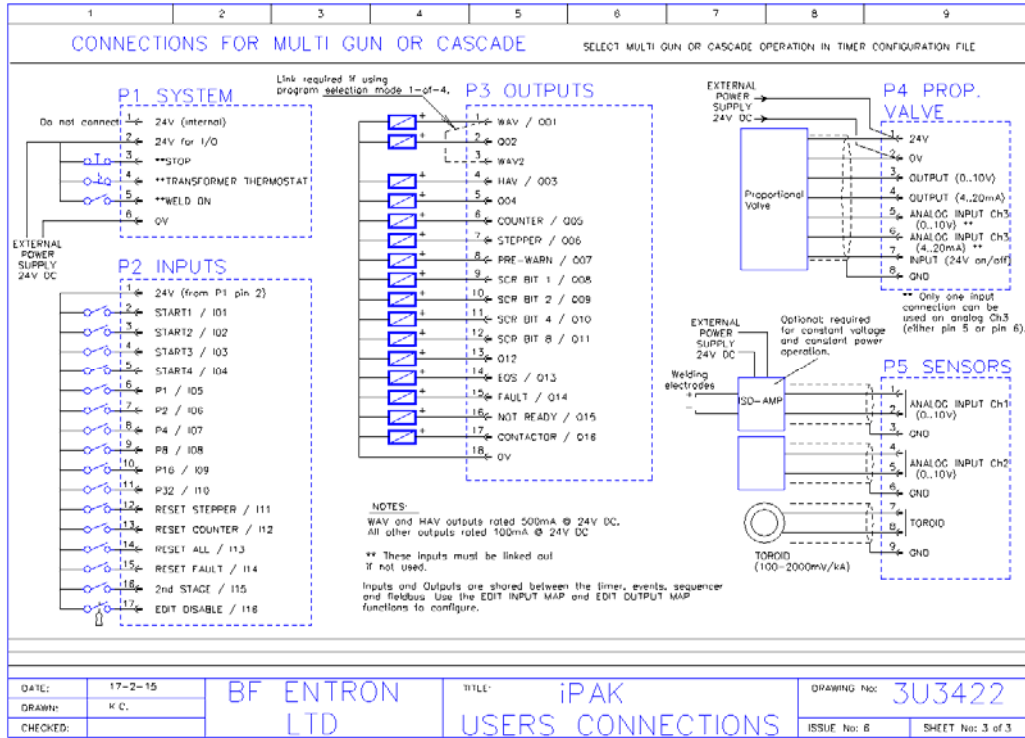
The EtherNet/IP implementation on IPAK2 uses different techniques compared with the original iPAK. If you are using EtherNet/IP then the access methods and bit allocations will need to be changed. Please consult the iPAK2 user guide for full details.
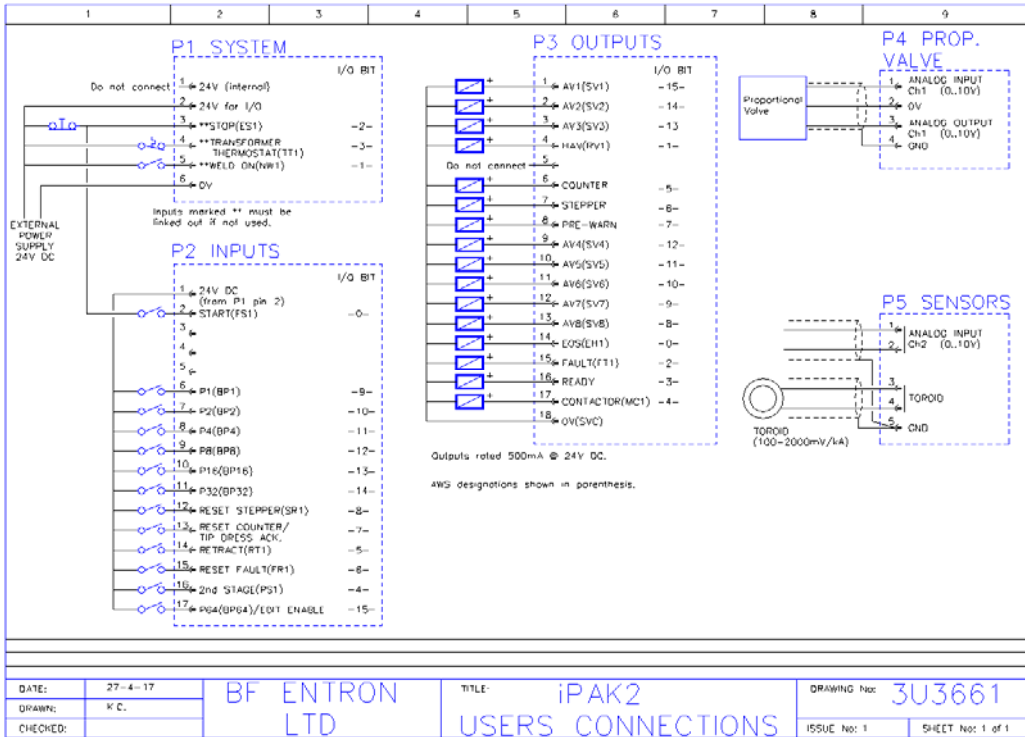
11. Users connection diagrams

11.1. iPAK
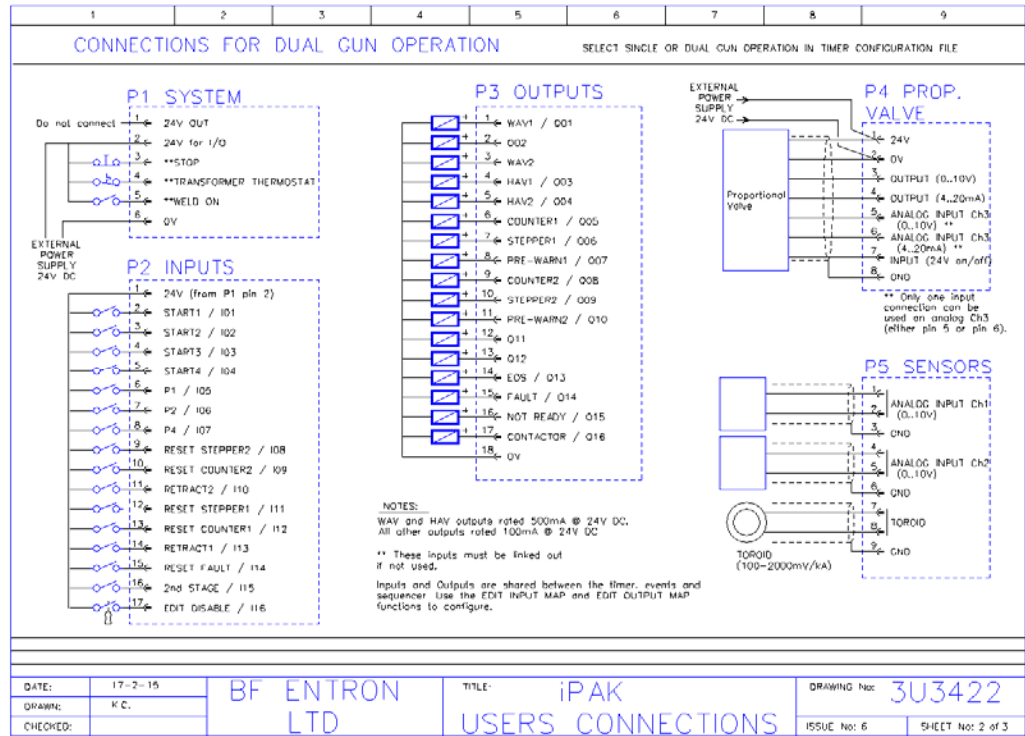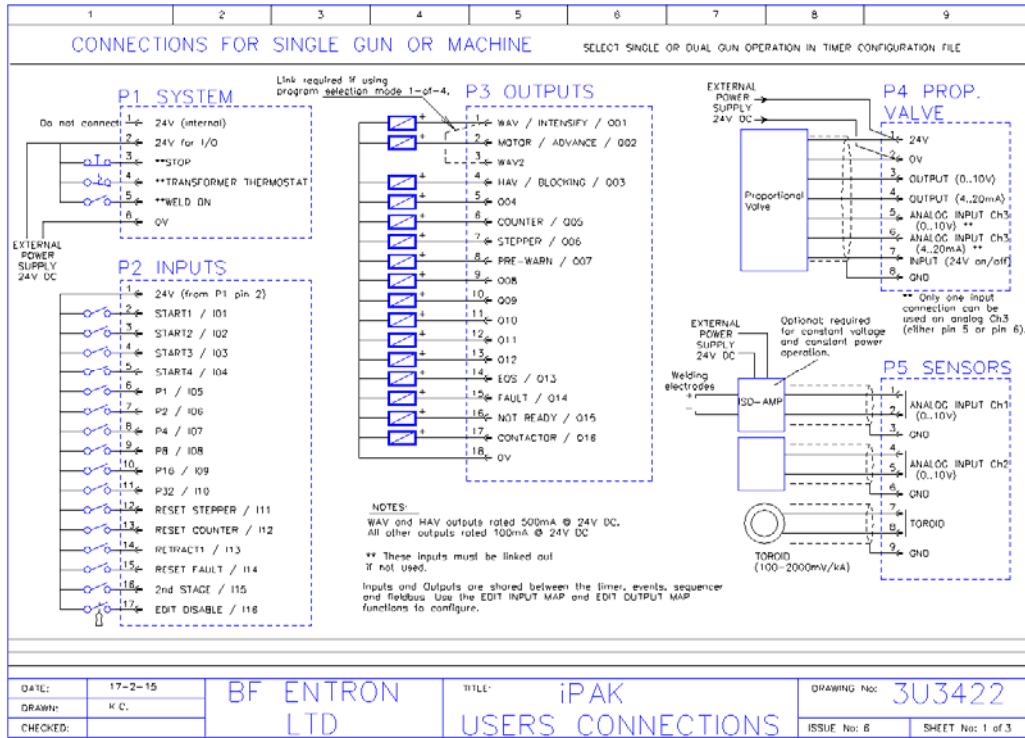
11.2.   iPAK2

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