Electrical Installation Requirements

Care should be taken to separate the power and signal cables to prevent electrical interference and possible damage due to inadvertent connection.

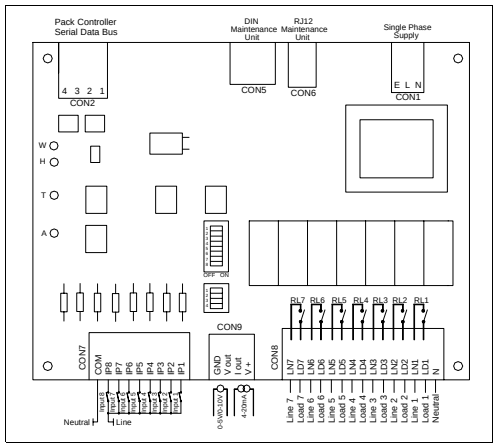
The inputs are electrically isolated. A line voltage should be connected for signal present. The terminal marked **COM** should be connected to the supply voltage neutral.

NOTE: The line voltage MUST BE on the same phase as the unit supply.
NOTE: This unit is not suitable for 60 Hz operation.

In order for inbuilt suppressors to function the outputs MUST be wired according to the wiring diagram.

CE Conformance

This unit conforms with the relevant EU standards when installed according to the JTL Installation Requirements for this product.



Description

JTL plant control interfaces are designed to be used with a JTL pack controller. The IF14 interface comprises 8 optically isolated mains "digital" inputs and 7 suppressed non-changeover relay outputs. The IF14 can replicate entirely the functions of the IF11 but in addition, a selectable 4-20 mA, 0-5 V, 0-10 V analogue output is provided. A JTL maintenance unit is required to configure this product.

Use of Maintenance Unit

The interface can be checked and the operation adjusted using a JTL portable maintenance unit which plugs into the interface. Each item of information has an item number. The more important items are listed in the tables overleaf. Examples:

To read item 30 press: ITEM 3 0 ENTER

To set item 31 to 2 press: ITEM 3 1 ENTER SET 2 ENTER

To correct errors press: CANCEL

To select next or previous items press: − and +

JTL Network Communications

The JTL network port (CON2) is arranged for 4 wire (full duplex) communications. The wiring of the port is:

	4 wire
1	Rx-
2	Rx+
3	Tx-
4	Tx+

Note all network products must be connected in parallel without cross connections. The Rx connections must be connected to the Tx connections at the pack controller.

Functionality & Configuration

The interface is designed to be connected on the plant zone of a JTL pack controller and can be set up in one of four operating modes (item 32).

Mode 0 (Item 32 = 0) Legacy

The interface is the functional replacement for an IF1 — 7 Relays are switched by the pack controller and the 8 opto-isolated inputs are reported back. The unique plant zone address for the interface is set via the maintenance unit on Item 30 - interface number and Item 31 - interface type (see overleaf for interface type setup).

Should the interface not receive a valid command from the pack controller for 90 seconds, the interface will drop in to backup mode and the red LED marked "A" is extinguished. Whilst in Mode 0 backup, the relays 1-7 are controlled by the bit switches 1-7 on SW1. When the switch is "ON" (or dot is showing) the corresponding relay is energised. They should be set in a combination suitable for failsafe operation. The interface remains in backup until valid communications with the pack controller are restored.

Mode 1 (Item 32 = 1) Enhanced compressor control

Operation is the same as Mode 0 except for the handling of fault conditions when the interface is controlling compressors. An appropriate 'healthy' signal must be present in order for the compressor to run regardless of the command from the pack controller. Item 33 determines the type of compressor control. Item 33 = 0 - Single (possibly multistage) compressor using Input 7 as the 'healthy' signal. Item 33 = 1 - Multiple compressors, compressor 1 uses Input 1 as the 'healthy' signal, compressor 2 uses Input 2 etc.

Backup in the event of a communication failure is as Mode 0.

Mode 2 (Item 32 = 2) Analogue output

The interface is a functional replacement for an IF4, 5 and 6 in Mode 2. As with Mode 0, the plant zone address is set up on Items 30 and 31. Relay 1 is energised if the control signal is non-zero. 4-20mA, 0-5V, or 0-10V is produced on CON9. Item 34 and SW2 MUST be set appropriately for current OR voltage output, and to specify control of condensers or compressors.

A backup value for the analogue output should be set on Item 35 for use in the event of a communication failure. Relay 1 is energised during backup if this value is non-zero. Please note that LED "A" is NOT extinguished in this mode.

Mode 3 (Item 32 = 3) Multi-compressor and analogue output

This mode is designed to run as a single interface used to control staged or multi-compressors and an inverter controlled ''trim'' compressor. The interface has two addresses on the pack controller plant zone. The address for the analogue control component is set on Items 30 and 31, whilst the address for the relay control component is set on Items 40 and 41. See table overleaf for configuration.

Relay 1 is the 'inverter run' output and is energised if the 'inverter healthy' signal is present on Input 8 AND there is a demand for the inverter to run from the pack controller. If Input 8 is absent, Relay 1 is controlled by the pack as a conventional single-stage compressor — useful for continued operation if the inverter has failed.

Backup is as Mode 2 if the analogue control command is not received from the pack controller. However if the relay control command is not received, backup is as Mode 0 for the relay outputs and analogue output is set to 0mA/0V.

Maintenance Features

In addition to address configuration, the maintenance unit enables the user to look at various items for diagnostic purposes.

Logical inputs (the inputs the pack controller sees) are displayed on item 71 in binary coded form. These input values can be forced to read differently by setting a non-zero value on item 78. The physical inputs however, are always displayed on item 100.

Logical outputs (outputs commanded by the pack controller) are displayed in binary coded form on item 72. Physical outputs are displayed on item 73. Physical outputs can be forced, overriding pack commands by entering a non zero value in item 79.

The binary coding works as follows:

1	=	input 1 / output 1
2	=	input 2 / output 2
4	=	input 3 / output 3
8	=	input 4 / output 4
16	=	input 5 / output 5
32	=	input 6 / output 6
64	=	input 7 / output 7
128	=	input 8

If more than 1 input or output is active then the code is added arithmetically.
Eg., input 1 & 3 active = 1 + 4 = 5.

Forced functions remain forced whilst the maintenance unit is plugged in. They are cancelled automatically 30 minutes after the maintenance unit is unplugged.

Four LEDs are located in the top left hand corner of the PCB. These are for diagnostic purposes.

W (Green) =	Watchdog, blinks if board is healthy
H (Green) =	Illuminated when interface processor is healthy
T (Red) =	Illuminated when interface is transmitting data to pack controller
A (Red) =	Illuminated when interface is in "Active" mode. ie, communicating correctly with pack controller

ADJUSTABLE PARAMETERS		
Item	Function	Range
30	Interface number	0 - 9
31	Interface type	0 - 15
32	Operating mode	0=Legacy 1=Enhanced compressor control 2=Analogue output enabled 3=Multi compressor and analog output
33	Enhanced compressor control (Item 32 = 1)	0=Staged compressor (non xPLT) 1=Multi compressor (xPLT)
34	Analogue mode** (Item 32 = 2 or 3)	0=4-20 mA (99 steps) 1=4-20 mA (127 steps) 2=0-5 V (127 steps) 3=0-10 V (127 steps) 4=0-10V (99 steps)
35	Analogue backup value**	0 - 127 Command value for analogue output in backup mode.
40	Secondary interface number (Item 32 = 3)	0 - 9
41	Secondary interface type (Item 32 = 3)	0 - 15

** When using analogue outputs, SW2 MUST be set up as follows:

4-20 mA	**0 - 5 V / 0 - 10 V**	C = closed O = open, X = don't care
C O X X	O C X X	

OTHER USEFUL ITEMS	
Item	Function
51	Latching input set status (to catch fleeting input setting)
52	Latching input clear status (to catch fleeting inputs clearing)
71	Logical input status (as seen by main controller)
72	Logical output status (as sent by main controller)
73	Output status (actual)
74*	Relay output status (as sent by main controller)
75*	Relay output status (actual)
78	Forced input status (for maintenance purposes)
79	Forced output status (for maintenance purposes)
100	Input status (actual)

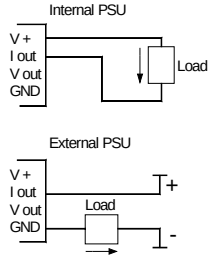
*when operating in mode 3 (Item 32=3)

Application Drawing for 4-20mA variable output condenser control using IF14 with EPIC & EPID Pack Controllers

Description:

JTL Plant Control Interface comprising 8 opto-isolated mains digital inputs 7 suppressed non-changeover relay outputs, and selectable current or voltage analogue output.
A JTL Maintenace Unit is used to configure this product.

4-20mA CONNECTIONS

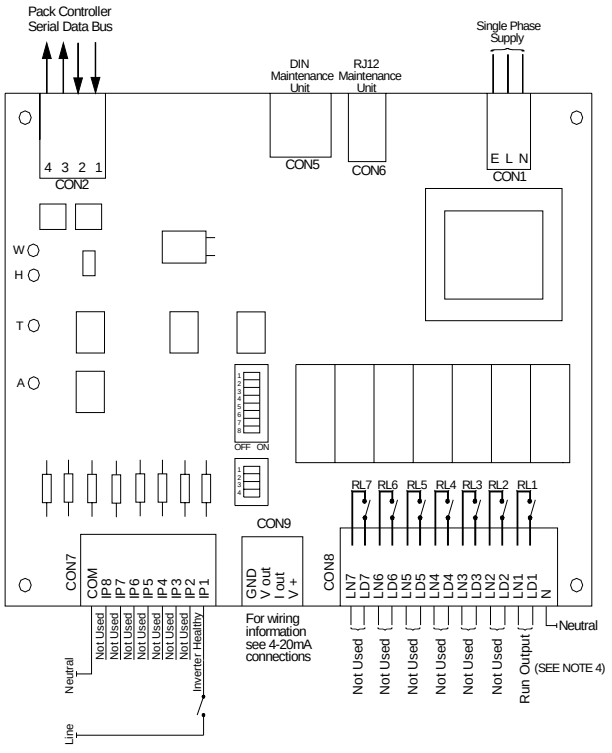


Arrows indicate conventional current flow. PSU must be DC.

Configuration

Interface type ITEM 31	Interface No ITEM 30
4	0
Analogue Mode ITEM 34	SW2 *
0	COOO

*C = Closed O = Open



NOTES:

1. To ensure that internally fitted suppressors work correctly, connect line voltages to terminals prefixed LN and the corresponding loads to terminals prefixed LD. Ensure neutral is connected to terminal marked N. CON8 'N' must have neutral connected to it.
2. A backup value to be used if serial data bus communications fail is set on item 35. Note that SW1 has no effect when IF14 is set for analogue mode.
3. Interface must be configured according to function using JTL Maintenance Unit.
4. Relay RL1 de-energises when the analogue output is minimum ie 4mA or 0v.
5. Line voltage present on Input 1 corresponds to inverter healthy.

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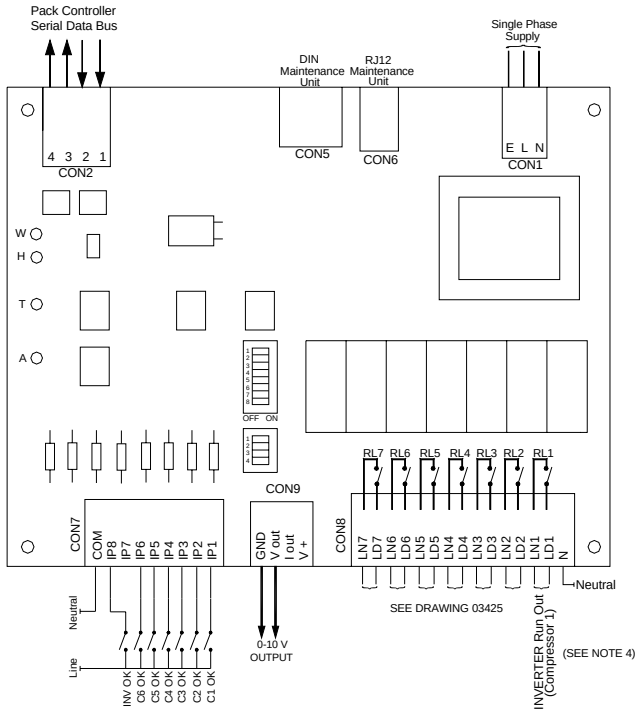
ISSUE	DESCRIPTION	APP'D	DATE
3	CHANGED NOTE 2 AND ADDED NOTE 5	MJK	03/03
2	ADDED NOTE 4 AND ARROWS SHOWING CURRENT FLOW.	MJK	02/03
4	ADDED EPIC & EPID TO TITLE	MJK	08/10

TITLE:
4-20mA VARIABLE OUTPUT CONDENSER INTERFACE FOR EPIC & EPID PACK CONTROLLERS

PROJ.	DRG No:	SHT	OF	ISS.
	02907	1	1	4

Application Drawing for 0-10 V variable output compressor control using IF14 with Pack Controllers EPIC & EPID



Description:

JTL Plant Control Interface comprising 8 opto-isolated mains digital inputs 7 suppressed non-changeover relay outputs, and selectable current or voltage analogue output.
A JTL Maintenance Unit is used to configure this product.

CONFIGERATION		
ITEM	VALUE	FUNCTION
30	1	INTERFACE No
31	7	INTERFACE TYPE
32	3	ANALOGUE & DIGITAL
34	3	ANALOGUE MODE
40	1	SECONDARY INTERFACE No
41	3	SECONDARY INTERFACE TYPE

SW2	1 2 3 4 0C00	ON C = (Closed) OFF O = (Open)

NOTES:

1. To ensure that internally fitted suppressors work correctly, connect line voltages to terminals prefixed LN and the corresponding loads to terminals prefixed LD. Ensure neutral is connected to terminal marked N. CON8 'N' must have neutral connected to it.
2. A backup value to be used if serial data bus communications fail is set on item 35.
3. Interface must be configured according to function using JTL Maintenance Unit.
4. Relay RL1 de-energises when the analogue output is minimum ie 0 V.
5. Line voltage present on Input 8 corresponds to inverter healthy.

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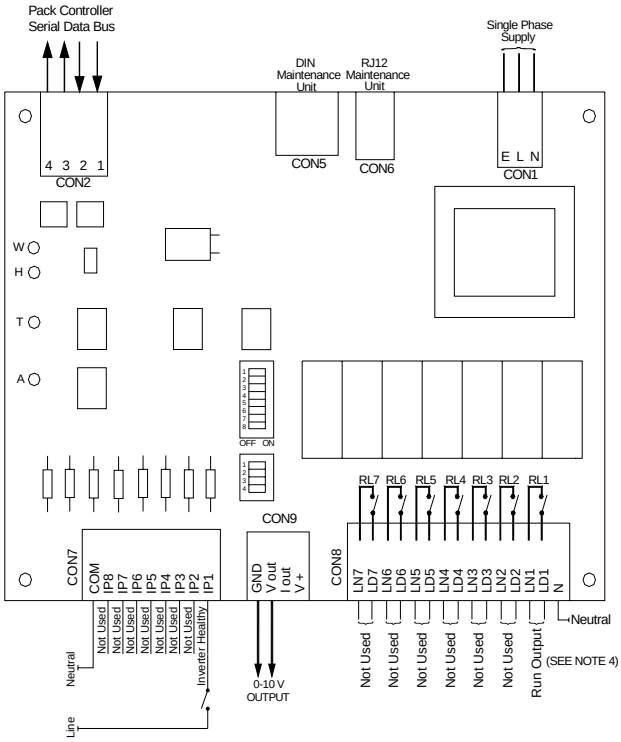
ISSUE	DESCRIPTION	APP'D	DATE
3	CONFIGERATION CHANGES	MJK	02/09
2	IP/7 CHANGED TO I/P8	MJK	10/07
4	NOTE 5 INPUT INCORRECT	MJK	11/09

TITLE: 0-10 V VARIABLE OUTPUT COMPRESSOR INTERFACE FOR PACK CONTROLLERS

PROJ.	DRG No:	SHT	OF	ISS.
	03316	1	1	4

Application Drawing for 0-10 V variable output condenser control using IF14 with EPIC & EPID Pack Controllers



Description:

JTL Plant Control Interface comprising 8 opto-isolated mains digital inputs 7 suppressed non-changeover relay outputs, and selectable current or voltage analogue output.
A JTL Maintenace Unit is used to configure this product.

Configuration

Interface type ITEM 31	Interface No ITEM 30
4	0
Analogue Mode ITEM 34	SW2 *
3	OCOO

* C = Closed O = Open

NOTES:

1. To ensure that internally fitted suppressors work correctly, connect line voltages to terminals prefixed LN and the corresponding loads to terminals prefixed LD. Ensure neutral is connected to terminal marked N. CON8 'N' must have neutral connected to it.
2. A backup value to be used if serial data bus communications fail is set on item 35. Note that SW1 has no effect when IF14 is set for analogue mode.
3. Interface must be configured according to function using JTL Maintenance Unit.
4. Relay RL1 de-energises when the analogue output is minimum ie 0 V.
5. Line voltage present on Input 1 corresponds to inverter healthy.

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ISSUE	DESCRIPTION	APP'D	DATE
2	ADDED EPIC & EPID TO TITLE	MJK	08/10
1	ORIGINAL ISSUE	MJK	12/06

TITLE: 0-10 V VARIABLE OUTPUT CONDENSER INTERFACE FOR EPIC & EPID PACK CONTROLLERS

PROJ.	DRG No:	SHT	OF	ISS.
	03315	1	1	2

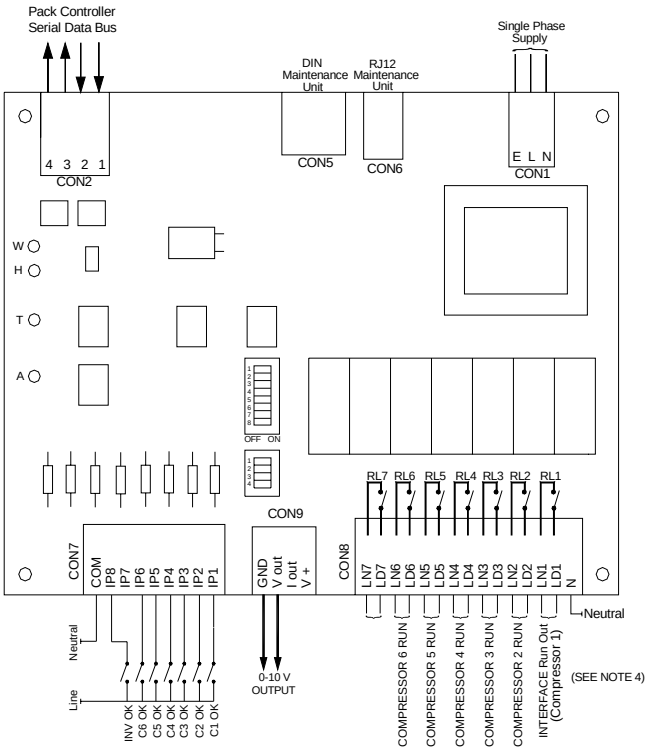
Application Drawing for 0-10 V variable output compressor control using IF14 with EPIL Pack Controllers

Description:

JTL Plant Control Interface comprising 8 opto-isolated mains digital inputs 7 suppressed non-changeover relay outputs, and selectable current or voltage analogue output.
A JTL Maintenance Unit is used to configure this product.

CONFIGERATION		
ITEM	VALUE	FUNCTION
30	1	INTERFACE No
31	7	INTERFACE TYPE
32	3	ANALOGUE & DIGITAL
34	3	ANALOGUE MODE
40	1	SECONDARY INTERFACE No
41	3	SECONDARY INTERFACE TYPE

SW2	1 2 3 4 0C00	ON C = (Closed) OFF O = (Open)



NOTES:

1. To ensure that internally fitted suppressors work correctly, connect line voltages to terminals prefixed LN and the corresponding loads to terminals prefixed LD. Ensure neutral is connected to terminal marked N. CON8 'N' must have neutral connected to it.
2. A backup value to be used if serial data bus communications fail is set on item 35.
3. Interface must be configured according to function using JTL Maintenance Unit.
4. Relay RL1 de-energises when the analogue output is minimum ie 0 V.
5. Line voltage present on Input 1 corresponds to inverter healthy.

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ISSUE	DESCRIPTION	APP'D	DATE
1	ORIGINAL ISSUE	MJK	02/09

TITLE: 0-10 V VARIABLE OUTPUT COMPRESSOR INTERFACE FOR JTL PACK CONTROLLERS

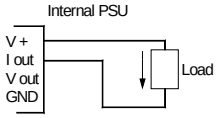
PROJ.	DRG No:	SHT	OF	ISS.
	03509	1	1	1

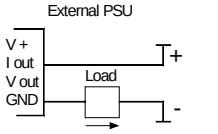
Application Drawing for 4-20mA variable output condenser control using IF14 with EP6U & EPLT Pack Controllers

Description:

JTL Plant Control Interface comprising 8 opto-isolated mains digital inputs 7 suppressed non-changeover relay outputs, and selectable current or voltage analogue output.
A JTL Maintenace Unit is used to configure this product.

4-20mA CONNECTIONS



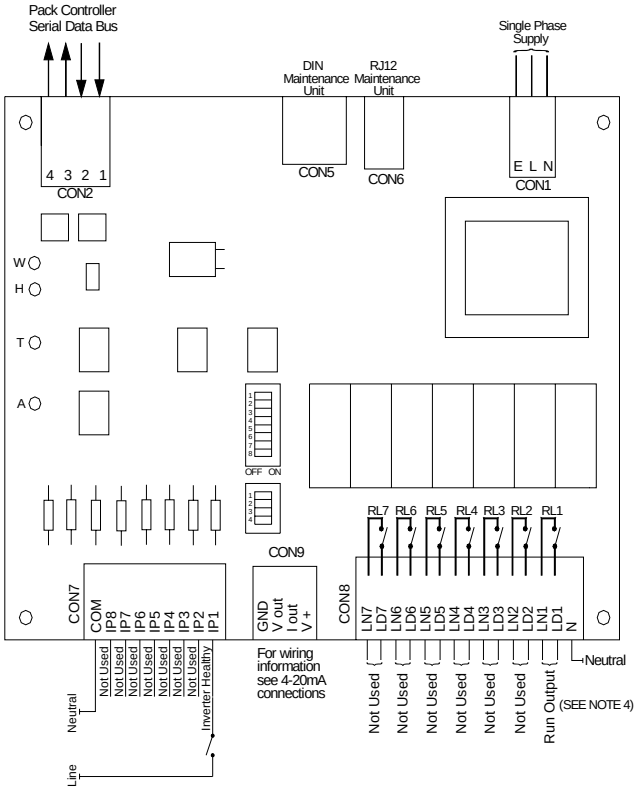


Arrows indicate conventional current flow. PSU must be DC.

Configuration

Interface type ITEM 31	Interface No ITEM 30
4	0
Analogue Mode ITEM 34	SW2 *
0	COOO

* C = Closed O = Open



NOTES:

1. To ensure that internally fitted suppressors work correctly, connect line voltages to terminals prefixed LN and the corresponding loads to terminals prefixed LD. Ensure neutral is connected to terminal marked N. CON8 'N' must have neutral connected to it.
2. A backup value to be used if serial data bus communications fail is set on item 35. Note that SW1 has no effect when IF14 is set for analogue mode.
3. Interface must be configured according to function using JTL Maintenance Unit.
4. Relay RL1 de-energises when the analogue output is minimum ie 4mA or 0v.
5. Line voltage present on Input 1 corresponds to inverter healthy.

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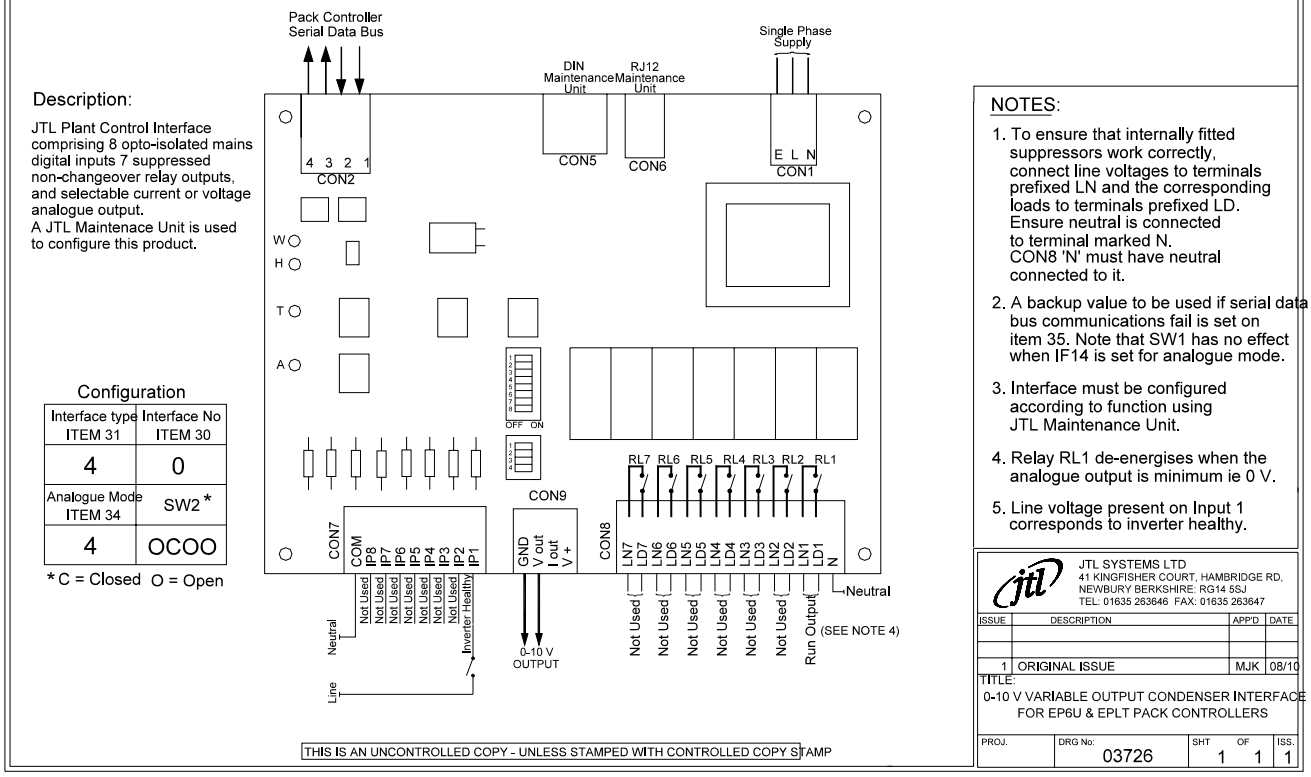
ISSUE	DESCRIPTION	APP'D	DATE
1	ORIGINAL ISSUE	MJK	08/10

TITLE: 4-20mA VARIABLE OUTPUT CONDENSER INTERFACE FOR EP6U & EPLT PACK CONTROLLERS

PROJ.	DRG No:	SHT	OF	ISS.
	03725	1	1	1

Application Drawing for 0-10 V variable output condenser control using IF14 with EP6U & EPLT Pack Controllers



Description:

JTL Plant Control Interface comprising 8 opto-isolated mains digital inputs 7 suppressed non-changeover relay outputs, and selectable current or voltage analogue output.
A JTL Maintenace Unit is used to configure this product.

Configuration

Interface type ITEM 31	Interface No ITEM 30
4	0
Analogue Mode ITEM 34	SW2 *
4	OCOO

* C = Closed O = Open

NOTES:

1. To ensure that internally fitted suppressors work correctly, connect line voltages to terminals prefixed LN and the corresponding loads to terminals prefixed LD. Ensure neutral is connected to terminal marked N. CON8 'N' must have neutral connected to it.
2. A backup value to be used if serial data bus communications fail is set on item 35. Note that SW1 has no effect when IF14 is set for analogue mode.
3. Interface must be configured according to function using JTL Maintenance Unit.
4. Relay RL1 de-energises when the analogue output is minimum ie 0 V.
5. Line voltage present on Input 1 corresponds to inverter healthy.

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ISSUE	DESCRIPTION	APP'D	DATE
1	ORIGINAL ISSUE	MJK	08/10

TITLE: 0-10 V VARIABLE OUTPUT CONDENSER INTERFACE FOR EP6U & EPLT PACK CONTROLLERS

PROJ.	DRG No:	SHT	OF	ISS.
	03726	1	1	1

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Full operating manuals and item number information can be obtained from your supplier or JTL Systems.
Technical documentation can also be obtained from our website www.jtl.co.uk.

Supply Requirements and Input/Output Specification

230 V ac 48-52 Hz
Supply 6 VA maximum
Inputs 2 mA maximum
Relay rating 5 A resistive
4-20 mA drive into 500 ohm - 2 max, 0-5 V/0-10 V source 30 mA max.

CE This unit conforms with the relevant EU standards when fitted in accordance with its installation instructions.

Application Documentation

Item Numbers	Doc No. 02786
Firmware Variations	Doc No. 02778
Connections Diagram	Doc No. 02765
Installation Requirements	Doc No. 02777
Outline Details	Doc No. 02783

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