

VT505

FOR MINI8 EC8
APPLICATION



Operating guide



invensys
EUROTHERM

VT505 for Mini8 EC8 Application

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1 GENERAL

1.1 Before switching on....

The VT505 and the Mini8 both use the same physical 24v dc power connector, but the electrical connections are not compatible. Be sure the correct connector is plugged into the correct device. Plugging the VT505 supply connector into the Mini8 will short-circuit the 24v dc supply.

1.2 Before you start....

The unit is pre-configured but some local settings are required at the commissioning stage to suit the particular usage.

- Entering text names for the loops (up to 8 characters)
- Selecting Units °C/°F
- Enabling/disabling cooling on some loops as required
- Setting all the conditions for the heater current monitoring and alarms.

1.2.1 Loop Names

The very first time the VT505 is powered up an error message 'Recipe Code does not exist' is displayed. (Touch the return arrow to continue.) This is because the start up recipe with the Loop Names has not been created and saved. This is the first task to be done.

Go to **Loops, U1** setup and enter text loop names for loops 1 to 8. Also select units °C or °F.

Similarly, if fitted, go to **U2, U3, and U4** and enter text names for the remaining loops. Also select units °C or °F.

Then (*very important*) **Save**. See Section 5.1

1.2.2 Loops with Cooling

Go to **Loops**, then each loop page in turn and set the cooling parameters: output power limit **OP LL** to enable (100%) / disable (0%) cooling and the minimum on time **Cool MinON** to select fan cooling (long) or water cooling (short). See Section 4.4

1.2.3 Current Monitoring

If the CT3 current monitoring option is fitted then this has to be commissioned.

Go to **Loops, U1** (also **U2, U3, U4** if fitted), enter the range of the current transformers and perform an auto or manual commissioning sequence. See Section 5.2

1.3 Whilst using the panel....

1.3.1 Password

Supervisory operation is protected by password. If the default password is changed then be sure to keep a safe record of the new password – recovering a lost password is not trivial and may involve returning the VT505 to the factory.

1.3.2 Service Page

Touching opposite corners of the VT505 panel in turn brings up the panel service page. This can sometimes happen inadvertently – just touch escape 'ESC' to return to normal operation.

2 LEVELS of OPERATION

2.1 *Normal Operation*

The panel shows an overview of all loops, including actual temperature, setpoint, output, and heater current. Setpoints may be adjusted within the setpoint limits. There are 8 loops on a page and up to 4 pages.

An alarm indicator is displayed when any alarm is present. All active alarms may then be viewed in a list.

Recipes may be selected from a prepared list and loaded to the Mini8s. There is only one recipe structure that will download to all Mini8s in a single operation.

2.2 *Supervisory Operation*

Password protected.

Recipes may be created and saved for later use by an operator.

Each loop is displayed on a single page and includes all key parameters including setpoint limits, PID, self-tune and loop enable/inhibit, alarm setpoints and alarm enable/inhibit.

3 OPERATION

The Panel is supplied pre-configured to be used with 1, 2, 3 or 4 Mini8s providing 8, 16, 24 or 32 loops. All the diagrams show the pages and navigation for the 32 loop version. The other versions are the same except that there will be fewer pages and the navigation will be abbreviated.

3.1 Overview page

This will be displayed on power up. It is the HOME page and the **Home** button shown on most other pages will return to this page.

Temperatures		Recipe	◆◆◆◆◆◆◆◆◆◆
Lp 1 ◆◆◆◆◆	Lp 9 ◆◆◆◆◆	Lp 17 ◆◆◆◆◆	Lp 25 ◆◆◆◆◆
Lp 2 ◆◆◆◆◆	Lp 10 ◆◆◆◆◆	Lp 18 ◆◆◆◆◆	Lp 26 ◆◆◆◆◆
Lp 3 ◆◆◆◆◆	Lp 11 ◆◆◆◆◆	Lp 19 ◆◆◆◆◆	Lp 27 ◆◆◆◆◆
Lp 4 ◆◆◆◆◆	Lp 12 ◆◆◆◆◆	Lp 20 ◆◆◆◆◆	Lp 28 ◆◆◆◆◆
Lp 5 ◆◆◆◆◆	Lp 13 ◆◆◆◆◆	Lp 21 ◆◆◆◆◆	Lp 29 ◆◆◆◆◆
Lp 6 ◆◆◆◆◆	Lp 14 ◆◆◆◆◆	Lp 22 ◆◆◆◆◆	Lp 30 ◆◆◆◆◆
Lp 7 ◆◆◆◆◆	Lp 15 ◆◆◆◆◆	Lp 23 ◆◆◆◆◆	Lp 31 ◆◆◆◆◆
Lp 8 ◆◆◆◆◆	Lp 16 ◆◆◆◆◆	Lp 24 ◆◆◆◆◆	Lp 32 ◆◆◆◆◆
Unit1		Unit2	Unit3
Unit4		Unit5	
Recipe		Loops	

This shows the name of the recipe and all the temperatures. All of these parameters are read only.

The **Unit1**, **Unit2**, **Unit3**, **Unit4** buttons go to the more detailed pages for each of those 8 loops.

The **Recipe** button goes to the recipe selection and download page

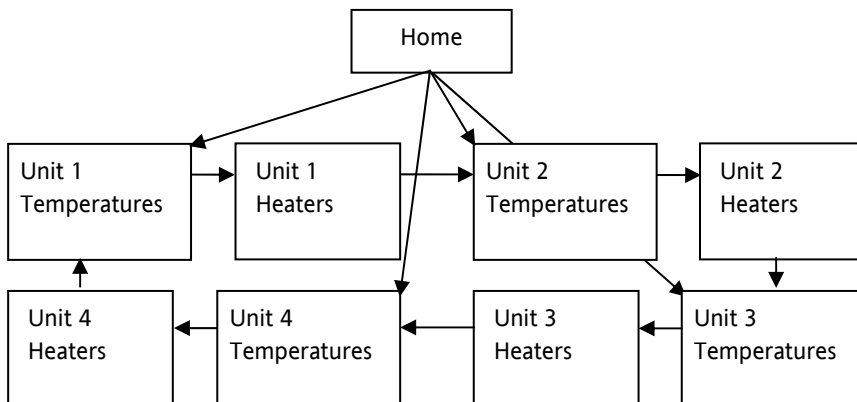
The **Loops** button is for Supervisor operation and is password protected.

3.2.1 Navigation

The **Recipe** button goes to the recipe selection and download page

The **Loops** button is for Supervisor operation and is password protected.

The '←' (previous) and '→' (next) buttons move to the previous or next page.



Arrows show the direction of the → (next) button

← (previous) goes in the opposite direction.

3.3 Unit Heater Page

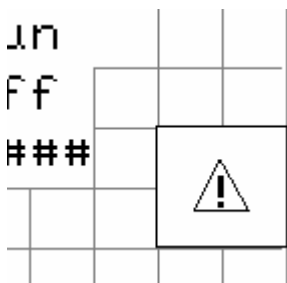
Unit 1		Heaters	
		Amps	Control
Lp 1	\$\$\$\$\$\$\$\$	*****	Enab
Lp 2	\$\$\$\$\$\$\$\$	*****	Enab
Lp 3	\$\$\$\$\$\$\$\$	*****	Enab
Lp 4	\$\$\$\$\$\$\$\$	*****	Enab
Lp 5	\$\$\$\$\$\$\$\$	*****	Enab
Lp 6	\$\$\$\$\$\$\$\$	*****	Enab
Lp 7	\$\$\$\$\$\$\$\$	*****	Enab
Lp 8	\$\$\$\$\$\$\$\$	*****	Enab
		Loops	< Home >

For each of the 8 loops the following parameters are shown

- Loop Number Lp1 (to Lp32)
- Loop Name \$\$\$\$\$\$\$\$ as set up at commissioning
- Heaters Amps Heater current when fully on
- Control 'Enab' – loop is operating
 'Inhib' – loop is inhibited (Off).

3.4 Alarms

If an alarm is active an explanation mark ! in a warning triangle is displayed near the top right corner.



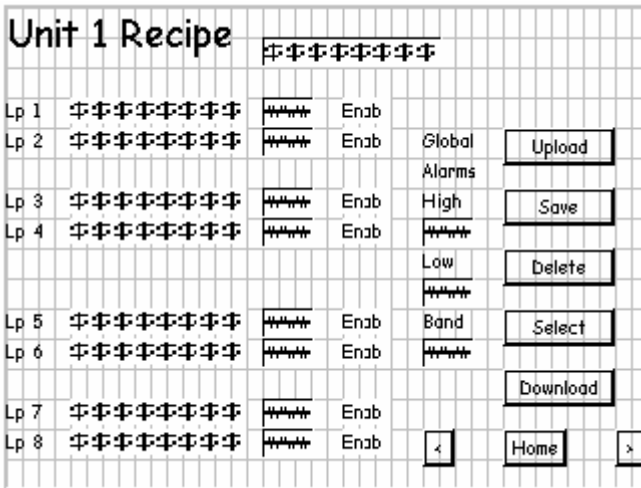
This is a touch button which displays a message page with one or two alarm messages shown. If there are more alarms up/down buttons allow all the active alarms to be viewed.

The following alarms are configured for each loop. Each alarm may be inhibited.

Alarm	Inhibit applies to
High Alarm	Loop
Low Alarm	Loop
Deviation Band Alarm	Loop
Sensor Break Alarm	Loop
Partial Load Failure Alarm	Unit
Over Current Alarm	Unit
Solid State Relay Failure Alarm	Unit

3.5 Recipe

The recipe button on the home page displays the Unit 1 recipe page. The other unit recipe pages can be viewed using the ‘<’ (previous) and ‘>’ (next) buttons. The **Upload**, **Save**, and **Delete** buttons are for Supervisor use and are password protected.



For each Loop the following parameters are displayed

- Loop Number Lp1 (to Lp32)
- Loop Name \$\$\$\$\$\$ as set up at commissioning
- Setpoint Setpoint in MEMORY – (not in the device)
- Control Loop Inhibit in MEMORY – (not in the device).
 where ‘Enab’ – loop is operating
 ‘Inhib’ – loop is inhibited (Off).

Also, applying to all loops in the unit

- High Alarm Setpoint in MEMORY – (not in the device).
- Low Alarm Setpoint in MEMORY – (not in the device).
- Dev Band Alarm Setpoint in MEMORY – (not in the device).

Each of the 32 loops has an individual setpoint and inhibit

Each Unit has its own unit wide alarm setpoints

3.5.1 To select and download a recipe:

1. Use the **Select** button to show a list of all saved recipes.
2. Choose the one required by highlighting (touching) it.
The values and the recipe name will now be displayed on this page (and on the recipe pages of the other units).
3. If they are correct press the **Download** button to send the values to all the units.

Job done! Note that this will send the recipe to ALL the Mini8 units in the system – not just Unit 1.

This means that the **Select** and **Download** buttons on ANY of the 4 recipe pages have the same effect – the recipe is downloaded to ALL units.

On power up the current recipe name in the VT505 will not have been retained so the recipe name will be blank, displayed as !!!!!!!!. Reselect the current recipe to retrieve the name, but it will not be necessary to download again as all the setpoints etc. will have been retained in the Mini8s.

The remaining Recipe buttons are for supervisor operations.

4 SUPERVISOR OPERATIONS

All the other pages in the panel are for the supervisor and are password protected.

4.1 *Recipe Management*

The **Upload**, **Save** and **Delete** buttons on the recipe pages allow recipes to be created, saved and deleted. Remember the values displayed on the recipe pages are parameters in memory NOT current values from the Mini8 units.

4.1.1 To create a new recipe

Enter the required values on the recipe pages. Enter a new name, Press **Save**.

4.1.2 To delete a recipe

The **Delete** button deletes the selected recipes. Use **Select** to choose the recipe and then use **Delete** to delete it. Confirmation is required before deletion takes place.

4.1.3 To create a new recipe

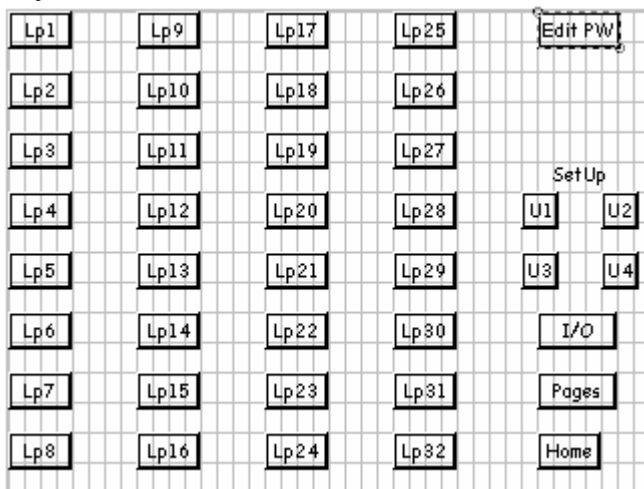
Upload - use with care! This will upload parameters from the Units to make a new recipe. Do not upload after a power up until at least one recipe has been downloaded. The consequence is that the Loop Names will be lost and will have to be re-entered. These can only be re-entered immediately after a power up. See Section 5.1

The **Upload** button will retrieve the current values of the recipe parameters from the units and display them on the panel. Use the **Save** button to save these values under a new name or over an existing one.

4.2 Loop Navigation Page

There is a page for every loop in the system. The Loops button will request a password first. After the password has been entered the Loops button will have to be pressed again. The password expires after 10 minutes.

The **Loops** button displays a navigation page allowing one key access to any loop in the system.



Lp1 to Lp32

Navigation to individual loop page

Edit PW

To change the default supervisor password

U1 to U4

Set up pages – to enter text names for each loop, units and to configure the heater current monitoring

I/O

Diagnostics – shows the state of all the I/O

Pages

Lists all the pages

Home

back to the Home page

4.3 Password

WARNING

The default password is 123456. If this is changed then be sure to keep a record of the new password securely as there is no quick recovery for lost passwords.

Setpoint	Setpoint selection – all 8 loops in the unit use the setpoint selected. Note that SP2 can also be selected by hardware. See 6.2
Loop	‘Enab’ – loop is operating, ‘Inhib’ – loop is inhibited (Off).
Tune	‘On’ – loop is tuning ‘Off’ - normal control
Stage	Tuning stage – will show ‘Running’ during tuning and ‘Complete’ at the end. If the tuning fails it will display ‘Timeout’, ‘TI_Limit’ or ‘R2G_Limit’.
Pb	Proportional Band in units
Ti	Integral time
Td	Derivative time
HiCB	High Cutback
LoCB	Low cutback
RCG	Relative cool gain
CoolMinOn	Minimum ON time for the cool output – long for fan, short for water cooling.
Alarms	
High	Enable/Inhibit for this individual alarm Setpoint – High alarm setpoint for the 8 loops in this unit
Low	Enable/Inhibit for this individual alarm Setpoint – Low alarm setpoint for the 8 loops in this unit
Band	Enable/Inhibit for this individual alarm Setpoint – Deviation Band alarm setpoint for the 8 loops in this unit.

5 CONFIGURATION

These set-up pages will normally only be used when the VT505/Mini8 system is first commissioned.

5.1 Loop Names

An 8 character text name can be given to each loop.

Loop Name Setup Page Mini8 Unit 1							
Lp1	#####						
Lp2	#####		Units				
Lp3	#####		°C				
Lp4	#####						
Lp5	#####						
Lp6	#####					Loops	
Lp7	#####					Save	
Lp8	#####				<	Home	x

The names are entered using an alphanumeric keypad shown on the screen. Remember there is a 'Names' page for each Mini8 unit.

The names must be entered and saved immediately after first power up without setting a recipe name.

The actual recipe name will be empty, shown as !!!!!!!!. This is the recipe automatically loaded on power up and it is essential that the names be saved under that name.

Enter the name for each of the 32 loops on all 4 names pages before saving.

The units are may also be selected on this page °C or °F. This has to be set on each names page, one for each Mini8 unit.

5.1.1 Changing Loop Names

The loop names are saved within each recipe. That is why it is important to enter the loop names first, as they will be resaved within every recipe in the VT505.

To change the loop names later, therefore, involves editing the names and resaving each and every recipe in the panel.

On a Recipe page **Select** a recipe, then on the names page(s) edit the names and **Save**. Remember to select and save the !!!!!!! start up recipe.

5.2 Heaters.

This applies only if the CT3 current monitoring module is fitted. Refer to the Mini8 Engineering Manual HA028581

Two pages are provided for each Mini8 unit to enable current monitoring to be configured. One contains the setup parameters that have to be set and the auto/manual configuration selection. The other contains the current alarm setpoints, the sampling interval and an alarm enable/inhibit.

Set Up page

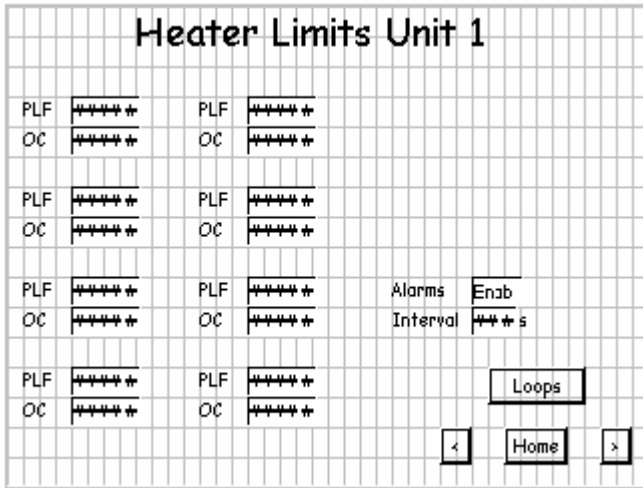
Required for Manual Configuration				CT	Range		
Load1 OP	OP25	Load5 OP	OP25	1	####		
Load1 CT	<input type="checkbox"/>	Load5 CT	<input type="checkbox"/>	2	####		
				3	####		
Load2 OP	OP25	Load6 OP	OP25		Leakage	Leakage Amps	
Load2 CT	<input type="checkbox"/>	Load6 CT	<input type="checkbox"/>	1	+ ####	+ ####	
				2	+ ####	+ ####	
Load3 OP	OP25	Load7 OP	OP25	3	+ ####	+ ####	
Load3 CT	<input type="checkbox"/>	Load7 CT	<input type="checkbox"/>		Config	Auto	
					Mode	Off	
Load4 OP	OP25	Load8 OP	OP25		Status	Not Comm'd	
Load4 CT	<input type="checkbox"/>	Load8 CT	<input type="checkbox"/>				
Loops				<	Home	>	

The Current Transformer ranges CT Range MUST be entered correctly; the range may be between 10 and 1000 amps.

5.2.1 Auto Commissioning

Once the wiring is all in place and the loops are controlling correctly set the **Config** to 'Auto'

If the auto commissioning is successful then all the other parameters will have been set. The heater alarm limits are shown on the second heater set up page.



Heater alarms can all be enabled **Enab** or all inhibited **Inhib**

The **Interval** is the time between each measurement of the heater current.

5.2.2 Manual Commissioning

Do not consider manual configuration unless you are confident that of the set up requirements.

Heater Setup Unit 1						
Required for Manual Configuration				CT	Range	
Load1 OP	OP25	Load5 OP	OP25	1	####	
Load1 CT	▮	Load5 CT	▮	2	####	
				3	####	
Load2 OP	OP25	Load6 OP	OP25		Leakage	Leakage Amps
Load2 CT	▮	Load6 CT	▮	1	####	####
				2	####	####
Load3 OP	OP25	Load7 OP	OP25	3	####	####
Load3 CT	▮	Load7 CT	▮		Config	Auto
					Mode	Off
Load4 OP	OP25	Load8 OP	OP25		Status	Not Comm'd
Load4 CT	▮	Load8 CT	▮			
Loops				<	Home	>

For all the loads the Load OP and Load CT have to be set. These must be done in order from 1 to 8.

The Mini8 output used for each loop has to be entered. For the VT505 EC8 application this will be Load 1 from OP25, Load 2 from OP26 ... Load 8 from OP32.

If any load is not used then the Load OP should be set to Not Used. These MUST be at the end.

The current transformer used (1, 2 or 3) has to be entered, based on how the heater loads have been wired. 0 = not used.

Then set **Config** to **Man**. Once this has completed and all is OK set **Config** to '**Accept**' and the **Status** will change to '**Commissioned**'.

5.3 I/O

A simple I/O page shows the I/O value on each of the Mini8 I/O cards. This will quickly indicate if there is a hardware fault.

IO Unit 1		Slot 1	Slot 3	Slot 4
		PV1 ****	PV17 ****	PV25 ****
		PV2 ****	PV18 ****	PV26 ****
		PV3 ****	PV19 ****	PV27 ****
		PV4 ****	PV20 ****	PV28 ****
DI 1	OFF	PV5 ****	PV21 ****	PV29 ****
DI 2	OFF	PV6 ****	PV22 ****	PV30 ****
Rly1	OFF	PV7 ****	PV23 ****	PV31 ****
Rly2	OFF	PV8 ****	PV24 ****	PV32 ****
				SetUp
				< Home >

6 INSTALLATION

Warning:

The VT505 and the Mini8 both use the same physical 24v dc power connector, but the electrical connections are not compatible. Be sure the correct connector is plugged into the correct device. Plugging the VT505 supply connector into the Mini8 will short-circuit the 24v dc supply.

Refer to the standard Mini8 installation sheet HA028497

6.1 Clone files

In 8, 16, 24 and 32 loop applications the clone file in the Mini8s is the same. The VT505 files however are different for each size.

Mini8_EC8_V100.VTS, Mini8_EC16_V100.VTS, Mini8_EC24_V100.VTS,
Mini8_EC32_V100.VTS.

There are 2 files for the Mini8 EC8 application, one with current monitoring and a separate one without current monitoring.

Mini8_EC8a_V100.UIC with current monitoring

Mini8_EC8b_V100.UIC without current monitoring

The same file is used in each Mini8 in multi-unit systems; the only difference is the communications address.

6.2 Address Switch

The top switch 8 must always be set.

For Unit 1 address is set to 1, 2 (if used) is set to address 2, 3 is set to 3, 4 is set to 4.

6.3 Fixed IO

Digital Input A selects second setpoint on all loops.

Digital input B clears the new alarm relay, relay B ('silence' action).

Relay A is energised if any alarm is active

Relay B is energised if any new alarm occurs (cleared by digital input B).

6.4 Slot 1

8 thermocouple inputs, type J inputs 1 to 8 for loops 1 to 8.

6.5 Slot 2

3 Current transformer input (for current monitoring units). Refer to the Mini8 Engineering Handbook HA028581.

6.6 Slot 3

8 Cool Outputs, logic outputs 17 to 24. Loops requiring cooling control must use the corresponding output:

i.e. if loops 2, 3, 4 require cooling then use outputs 18, 19, 20.

6.7 Slot 4

8 Heat Outputs, logic outputs 25 to 32 for loops 1 to 8.

6.8 Communications

Use Eurotherm cable SUBVT505/Cable/485/3.0 from the VT505 to the Mini8. The Mini8 connector is an RJ45 socket and the cable may be extended using standard Cat5e patch cables.

VT505

FOR MINI8 EC8
APPLICATION



Operating guide



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