



HTC-DIGITAL-LCD

PROGRAMMABLE TEMPERATURE CONTROLLER c/w YEARLY PROGRAMMABLE TIME SWITCH

COMPATIBLE WITH A WIDE RANGE OF SENSORS



ROOM



O/A WALL



DUCT



PIPE

Features

- Measure & Control Temperature & CO2 levels with analog & digital I/O
- Temperature Inputs can be Thermistors or 0-10vDC
- Five 8 Amp (2.5) Relays . 4 Freely Configurable
- Two 0-10VDC Analog Configurable Outputs
- LED Indication of Relay Outputs
- O/A Temperature Input to Allow use of Fresh Air for Cool & Heat if Suitable
- Preset for most Common Usage but easily Editable with intuitive Menu
- Mounts in most M.C.B din rail enclosures
- Event Driven Time Switch allowing switching **Past** Midnight.
- Optional connect CO2 & O/A sensors to override Economy cycle Dampers.
- Programmable Start by Internal 365 day T/Switch **& or** Push Button triggered Run Timer **& or** Manual On/Off Switch.
- **Modbus** Override Control & Monitoring.

Use

The **HTC-DIGITAL-LCD** is usually mounted in the mechanical services switchboard and connected to remote measuring sensors by 2 or 3 wire screened cable (or alternatively can be located in the air conditioning control cabinet). The Controller is a fully programmable microprocessor based Temperature Controller with optional use of an internal 365 day Time Switch & / or Run Timer facility all in the one model. The Controller is intended for applications where On/Off control of Heating and Cooling stages and / or control of modulating actuators is required. Four of the five relays are programmable for their mode of operation (as heat, cool stages or as both) and for their individual switching characteristics. The 5th relay is dedicated as a System Run (fan/ time switch) relay. Two Analog 0-10vDC output signals can be programmed individually for start, range and mode of operation. Outside Air Temperature and Room (or R/A duct) CO2 sensors can also be optionally connected to override motorized modulating economy cycle damper operation. Fresh air intake levels (Economy Damper operation) due to high CO2 levels can be limited in extreme outside air temperatures so as not to lose temperature control on extreme high or low ambient days.

Technical Data

General Specifications	Operating Voltage	12 to 24 Volts AC or DC
	Power Consumption	
	At 24vDC Volts	200mA
	At 24vAC Volts	5 VA
	Switching Capacity of Relays	
	Voltage	AC 0....250 Volts
	Current	8.0 (2.5) Amps
	Set point Setting Range	1....50 oC in 0.1 oC Increments
	Relay Switch ON Points (Dead band)	0.1....19.9 oC
	Relay Hysteresis (Switching Differential)	0.1....9.9 oC
	Relay to Energise Time Delay	0.1....42 Minutes
	Y1/Y2 Output Voltage Range	0....10VDC
	Y1/Y2 Start Point (Dead band)	0.....19.9 oC
	Y1/Y2 Range (Proportional Band)	0.5....25 oC
Y1/Y2 Integral action (P+I triggers >10% P output)	Off....60 minutes	

INPUTS

- X1 : Main Measurement Temperature Sensor Input configurable (with jumper) as either Active (0-10vdc ~0 to 100c (adjustable) or Passive (4.2k@22c).
- X2 : Remote Setpoint (10K Potentiometric) 18-25 oC Range
NOTE : Automatically changes over to remote setpoint control **if** connected.
- X3 : Outside temperature sensor configurable (with jumper) as either Active (0-10v~0-100c) or Passive (4.2k@22c) (factory default).
- X4 : Room or R/A Duct CO2 Sensor input to override economy cycle operation

Output Indication

Relay On/Off Status	5 x Red LED
LCD Display	2 x 16 character LCD
Display Resolution	0.1 Increments

Communication

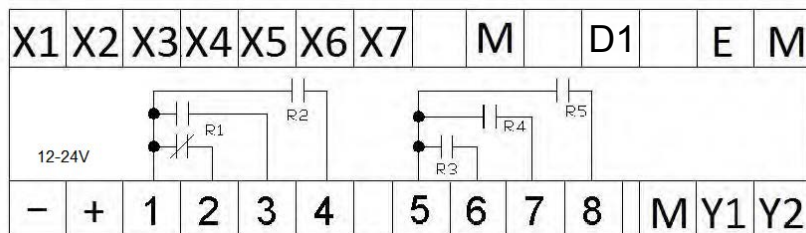
Terminal's X5,X6 & X7 configurable as RS485 MODBUS Outputs

Technical Data (Cont.)

Environmental Conditions	Operation	
	Ambient Temperature	0...45oC
	Humidity	< 85 % RH (Non Condensing)
	Storage and Transport	
	Ambient Temperature	-5...65oC
	Humidity	< 90 % RH (Non Condensing)
Product Standards	COMPLIES TO ALL RELEVANT AUSTRALIAN STANDARDS	
Weight	Including Packaging	600 grams
Housing	Colour	Grey
	Material	ABS POLYCARB
	UV Stabilised	YES
	Fire Retardant	YES
	Size	L105mm x W105mm x D60mm
	Mounting Method	35mm Din Rail Mountable

Terminal Designations

X1	Main Temperature Sensor Input (Passive or Active)	M	Common sensor & signal ground
X2	10 k Ohms Remote set Point (Optional connection)	D1	System ON/OFF or AHR input
X3	O/A sensor for Econ.Cycle (Optional connection)	E & M	Expansion O/P to slave module
X4	CO2 Room or R/A Duct sensor (Optional connection)		
X5	MODBUS RS485 - A Terminal		
X6	MODBUS RS485 - B Terminal		
X7	MODBUS SHIELD (GND)		



-	12-24 Volt Supply Neutral (internally connected to terminals M)	5	Relay 3,4 & 5 Common
+	12-24 Volt AC or DC Supply Active	6	Relay 3 Normally Open
1	Relay 1 & 2 Common	7	Relay 4 Normally Open
2	Relay 1 Normally Closed	8	Relay 5 Normally Open (FAN)
3	Relay 1 Normally Open	M	signal ground
4	Relay 2 Normally Open	Y1	Analog Modulating Output 0-10 vDC
		Y2	Analog Modulating Output 0-10 vDC

Abbreviations & Definitions

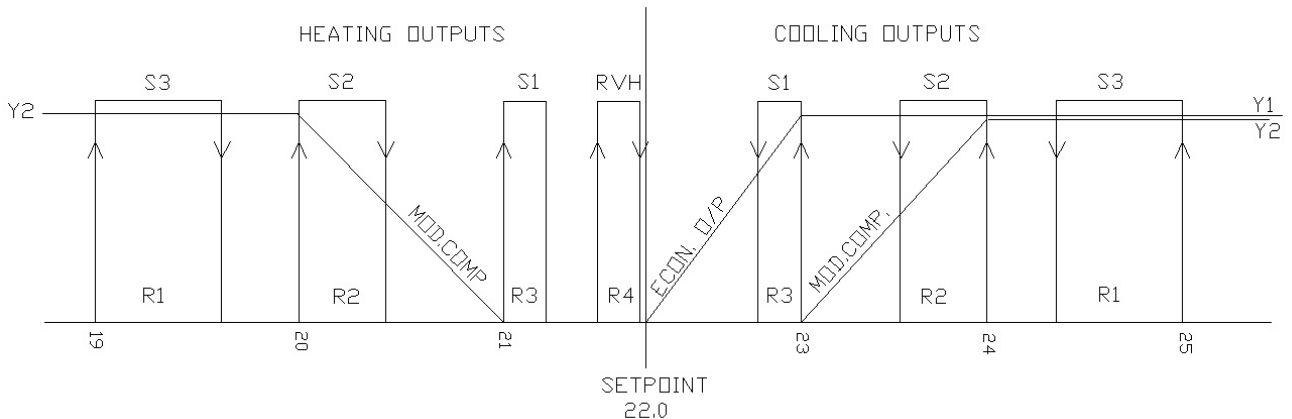
DB	Dead Band in Degrees Celsius
SD	Switching Differential in Degrees Celsius
PB	Proportional band in Degrees Celsius
TD	Time Delay in minutes & seconds
I	Integral Time in minutes & seconds
MODE	H = <u>HEAT</u> ONLY MODE
	C = <u>COOL</u> ONLY MODE
	B = <u>BOTH</u> HEAT & COOL MODE

Pre Loaded Program

FACTORY DEFAULT SETTINGS

3 Stage Reverse Cycle A/C Unit
 Y1 Set as Economy Cycle o/p (Cool only) (P only mode)
 Y2 Set as Modulating Compressor output (P only mode)
 O/A sensor input Disabled (enable if on O/A sensor connected) jumper set for passive
 CO2 sensor Input Disabled (enable if CO2 sensor to be connected)
 Start / Stop Mode via Time Switch Operation Mon-Fri 8:00-17:30
 After hours / Run Timer set for 2 hours

RELAY	MODE	DB	SD	PB	I	TD	USE
R1	B	3.0	1.0			3.0	HEAT & COOL STAGE 3 (COMP.3)
R2	B	2.0	0.7			2.0	HEAT & COOL STAGE 2 (COMP.2)
R3	B	1.0	0.3			1.0	HEAT & COOL STAGE 1 (COMP.1)
R4	H	0.5	0.4			0.1	REVERSING VALVE HEAT MODE
R5							FIXED AS SYSTEM ON RELAY (FAN)
Y1	C	0.1		1.0	OFF		ECONOMY CYCLE DAMPER O/P
Y2	B	1.0		1.0	OFF		MODULATING COMPRESSOR O/P





PROGRAM MENUS

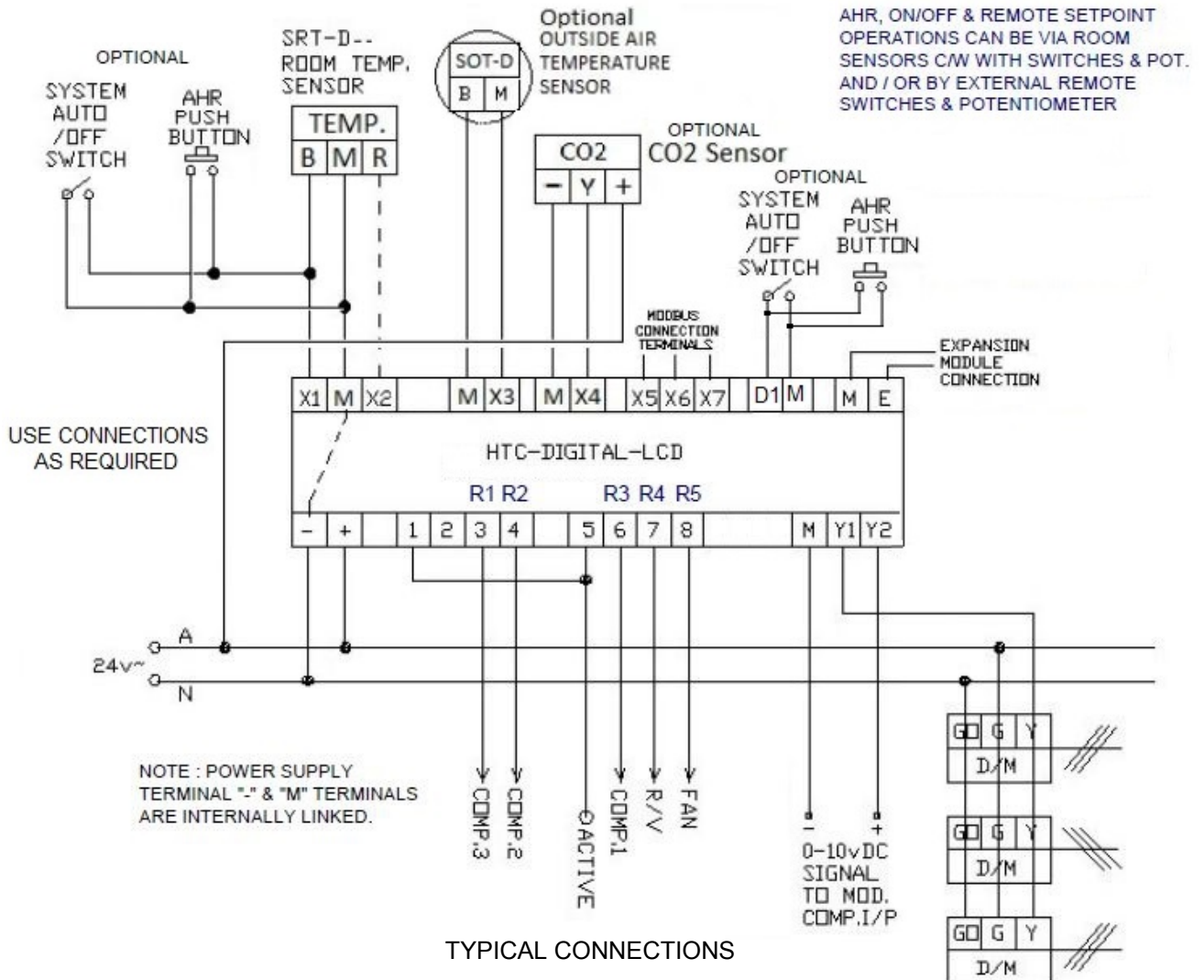
<u>MENU NAME</u>	<u>FUNCTION</u>
SET OPERATING MODE	TO SET <u>SYSTEM ON/OFF OPERATION</u> BY EITHER THE INTERNAL TIMESWITCH, INTERNAL RUN TIMER (Triggered by remote push button) OR REMOTE MANUAL ON OFF SYSTEM SWITCH (by shorting out the sensor terminals).
RUN TIMER DURATION	TO SET <u>RUN TIMER DURATION</u> FOR USE AS AN AFTER HOURS RUN TIMER OR AS A SYSTEM RUN (FOR) TIMER (instead of time switch)
SET TIME SWITCH	TO SET <u>START AND FINISH TIME</u> FOR EACH DAY OF THE WEEK.
SET HOLIDAYS	TO SET INDIVIDULE OR GROUP <u>HOLIDAY</u> SYSTEM <u>OFF</u> DATES.
RELAY PROGRAMMING	TO SET <u>MODE & SETTINGS</u> FOR THE 4 PROGRAMMABLE <u>RELAYS</u>
ANALOG OUT PROGRAMMING	TO SET <u>MODE & SETTINGS</u> FOR THE 2 PROGRAMMABLE <u>ANALOGUE</u> O/P's
(X3) O/AIR TEMP. ECON. CYCLE INHIB.	TO ENABLE & ADJUST SETTINGS FOR <u>O/A TEMPERATURE</u> SENSOR TO <u>INHIBIT ECONOMY CYCLE</u> OPERATION WHEN O/A IS NOT FAVORABLE.
(X4) HIGH CO2 ECON. CYCLE INHIB.	TO ENABLE & ADJUST SETTINGS FOR A ROOM or (R/A DUCT) <u>CO2</u> SENSOR TO OPERATE THE ECONOMY CYCLE OPERATION WHEN MEASURED <u>CO2 IS HIGH</u> .
SET CLOCK	TO SET THE CONTROLLERS , <u>TIME, DATE AND ENABLE DAY LIGHT SAVING</u> .
X1 SENSOR CONFIGURATION	ROOM SENSOR AS ACTIVE OR PASSIVE, & OFFSET & RANGE ADJUSTMENT .
MODBUS SETUP	SET MODBUS ADDRESS & CONNECTION SPEED.
RESTORE FACTORY DEFAULTS	CLEARs MEMORY AND RESTORES THE CONTROLLER TO <u>FACTORY DEFAULTS</u>
PRESS ENTER TO EXIST MENU	TO <u>EXIT</u> THE PROGRAM <u>MENU</u> AND RETURN TO NORMAL OPERATION.

Typical Wiring Connections

AVAILABLE SENSORS

SRT-D	ROOM TEMPERATURE SENSOR	2 WIRE
SRT-DSW	" + ON/OFF SWITCH	2 WIRE
SRT-DSP	" C/W SETPOINT POT.	3 WIRE
SRT-DSPSW	" C/W S/P + ON/OFF SW.	3 WIRE
SDT-D	DUCT TEMPERATURE SENSOR	2 WIRE
SOT-D	OUTSIDE AIR SENSOR (PASSIVE)	2 WIRE
OSAO	OUTSIDE AIR SENSOR (ACTIVE)	3 WIRE
CDT-2N40	ROOM CO2 SENSOR	3 WIRE
CDT-2N44	ROOM TEMP. & CO2 SENSOR	4 WIRE

Note : if a remote setpoint device is connected (X2) then local setpoint control (via UP & DOWN buttons) is disabled.



Wiring Considerations

- Supply Voltage** The Controller requires either a 12-24Volt AC or DC Supply. This diagram assumes a 24 Volt AC connection. Note terminals "M" & "-" are **internally** connected so as to allow a common ground reference.
- Cabling Requirements** Its is recommended to connect remote input devices using twisted pair screened cable. Screened cable shield should be grounded to a good Earth at the controller end only.