# K190E. Enhanced 4 Channel Temperature Monitor & Controller v2.0

- All commands are single character followed by data if applicable.
- All commands are processed as each character is received.
- Once a command has started each subsequent character must be received within 2 seconds otherwise timeout.
- If command executes correctly then either data OR a '#' is returned, followed by CR/LF.
- If command error OR timeout then a '?' is returned, followed by CR/LF.
- In thermostat mode the channel links the same numbered sensor and relay together eg. sensor 1 and relay 1, sensor 2 and relay 2, etc.

## Commands:

**Nx.................. Relay On**
>    where 'x' = relay number 0,1,2,3,4 (0 = all relays)

**Fx .................. Relay Off**
>    where 'x' = relay number 0,1,2,3,4 (0 = all relays)

**Gx ................. Relay Toggle**
>    where 'x' = relay number 0,1,2,3,4 (0 = all relays)

**Sx .................. Relay Status**
>    where 'x' = relay number 0,1,2,3,4 (0 = all relays)

**Tx.................. Temperature**
>    where 'x' = sensor number 0,1,2,3,4 (0 = all sensors)

**Dx.................. Dump temperature** for ALL sensors (as per T0 command) and status of ALL relays.
>    where 'x' = time interval as follows:
>    0 = Off,   1 = 5 sec, 2 = 10 sec, 3 = 30 sec, 4 = 60 sec
>    5 = 2 min, 6 = 5 min, 7 = 10 min, 8 = 30 min, 9 = 60 min

**HxSSSD........ Set thermostat - Heating mode**
>    where 'x'   = channel number 0,1,2,3,4 (0 = disable all heating channels)
>    'SSS' = Setpoint temperature in range '-55 to 125' (ie. -055 to 125)
>    'D'   = Dropout temperature in range '0 to 9'
>    **Note:** Setpoint temperature must be 3 digits with leading zeros if necessary.
>    For negative temperatures a '-' sign must precede the 3-digit temperature value Eg –025
>    Setting saved on exit.
>
>    **Operation:**     If temperature < SSS then relay ON
>                        If temperature > SSS + D then relay OFF

**CxSSSD........ Set thermostat - Cooling mode**
>    where 'x'   = channel number 0,1,2,3,4 (0 = disable all cooling channels)
>    'SSS' = Setpoint temperature in range '-55 to 125' (ie. -055 to 125)
>    'D'   = Dropout temperature in range '0 to 9'
>    **Note:** Setpoint temperature must be 3 digits with leading zeros if necessary.
>    For negative temperatures a '-' sign must precede the 3-digit temperature value. Eg –025
>    Setting saved on exit.
>
>    **Operation:**     If temperature > SSS then relay ON
>                        If temperature < SSS - D then relay OFF

**Mx................. Display thermostat settings**
>    where 'x' = channel number 0,1,2,3,4 (0 = all channels)
>    Display format:  HxSSSD (heating) or CxSSSD (cooling)
>                          where 'x' = channel number 1,2,3,4
>                          'SSS' = setpoint temperature
>                          'D' = Dropout temperature

**? .................... Print banner/version number**