JC Systems
Model 2020 FastTRAC

Environmental Chamber Programmer/Controller

Complete Single, Dual or Three Channel Control System.
or
**- Patented FastTRAC –
Part Temperature Control.**
or
FastTRAC Control Plus Second Channel for Vibration, Humidity, Altitude or other Process.

Quarter Din Package with Full Feature Front Panel Display and Keypad.

Vivid Vacuum Fluorescent Front-Panel Display with EMI Shield and Intensity Control.

Simple Menu guided Setup and Operation.

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32 bit Motorola Cold Fire Microprocessor for Exceptional Control Precision
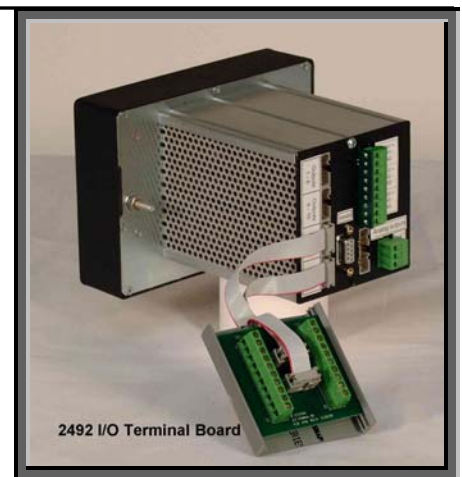

Flash Ram Program and System Configuration storage.

Real Time Clock

Simple Digital I/O Hook-UP

The JCS 2492 I/O Terminal board provides ribbon cable interface to the Model 2020, and remote terminal strip access for accessible external wiring. The JCS A2320 SSR Board can also be used to provide AC or DC Solid State Relay control of any or all of the 16 digital outputs.

Connections You Can Make

The three analog inputs, each assignable to any control channel, connect directly to the analog input terminal board. Digital I/O and the Six Channels of Analog Output are connected via ribbon cable to external I/O boards for easy interface.

Six Assignable Analog Outputs

Each analog output can be assigned to any channel for any function. The Standard output is 0 to 5 VDC and can be converted to 4 to 20mA by installing the small optional daughter board for the appropriate channel.

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2020 Features

- **The 2020 is especially designed for Temperature, Humidity, or Altitude Chamber Systems (both mechanical and LN2 cooled)**

- **Three channel unit, configurable as:**
  - **Three channels**
  - **Two channels**
  - **Single channel**
  - **FastTRAC plus an additional control channel**
  - **FastTRAC only**

- **Small body size - ¼ Din cutout with only 5 ½ inches depth required behind panel**

- **Large - Easy to View with Vacuum Florescent 6 line graphics display on 6 ¼" x 4 ½" front panel**

- **Easy Screen Navigation (Reset button always returns view to Home Screen Display)**

- **8 Photo Coupled Logic Inputs - assignable to various different input functions to fit specific requirements:**

  - **Run the current program**
  - **Stop (hold) the current program**
  - **Reset the current program to Step 1**
  - **Run a pre-selected program at specified step**
  - **Clear a Latched Limit**
  - **Go-to a specific program and step if specified condition met**
  - **Lock out front panel screen access**
  - **Hold the program clock, resume when released**
  - **Kill Ch 1 outputs**
  - **Kill Ch 2 outputs**
  - **Kill Ch 3 outputs**
  - **Kill All control Outputs**

- **Logic of each input can be configured to fit specific requirement:**

  - **Low input = true**
  - **Hi input = true**
  - **Low to Hi Transition = true**
  - **Hi to Low Transition = true**

- **Each input can be combined with another input or "virtual" output to perform the logical actions:**

  - o **Gated by**
  - o **Or with**
  - o **And with**

- **The ability to logically interconnect output and input functions from the front panel allows the capability to accomplish many of the functions that would normally require an additional PLC**

- **The logical interconnections eliminate the majority of the external wiring, relays and timers required for system operation**

- **All configurations, and programs stored in non-volatile Flash Memory**

- **2020 Firmware can easily be upgraded ON SITE as new features become available**

- **16 digital Control and Logic outputs - assignable to the functions required for your system**

- **6 Analog Voltage outputs which are assignable to any of the Process Retransmit, Setpoint Retransmit or Logic Outputs**

- **Any of the six Analog Voltage outputs can be configured as a current loop output, by plugging in an optional current loop daughter board**

- **10 Virtual (internal use only) outputs are available for logic use**

- **Built in 232, 422 (full duplex) and 485 (half duplex) serial ports**

- **GPIB available with use of a GPIB converter (utilizing the 422 full duplex port)**

- **System wiring and connection to the 2020 are made to track mounted terminal boards, solid state relay boards or an analog output board. Simply PRE-WIRE your system connections and plug the ribbon cables into the 2020**

- **Programs are easy to enter from the front panel. Page down twice to the PROG: MAIN MENU screen. Select EDIT A PROGRAM to change an existing program, or CREATE A PROGRAM for a new program**

- **Simple and easy computer text string commands allow the reading and setting of process values and setpoints for all three channels**

- **Creating programs for computer downloading is easy.   Use the supplied templates (tab delimited text) to create downloadable spreadsheet programs using Excel or Quarto Pro**

- **Save the file as a Text File (comma or tab delimited) and its ready to be sent to the 2020.   Its as simple as 1 – 2 - 3**

  1. **With the 2020 in remote mode, send a "FRS nn" to the 2020 as a text string. The nn represents the program number you are going to create. This opens a buffer area in temporary memory**

  2. **Send the text string "SPG". Next send the program file previously created or saved from the 2020. An "ok" is returned when the program is accepted**

  3. **Send the "SAV" text string to the 2020 to save the program from the Program Buffer area to the Flash Memory**

- **Automatic checking of the current 2020 configurations with those specified by the program being downloaded is built in. The program will not load if the configuration and units for the channels do not match those specified in the program**

- **Differential Inputs for each control channel can be configured for:**
  - **Thermocouples**
  - **RTD's: Both .0385 and .0392 probe input selections**
  - **Altitude 0-15 PSIA or 0-20 PSIA**
  - **Linear 4-20 ma or Linear 0-20 ma**
  - **Linear 0-1V**
  - **Vaisala 0-20ma Humidity Sensor**
  - **Wetbulb/drybulb humidity with %RH humidity display and control**

- **Built-in Dual 200 micro amp Constant Current sources provided for each of the three channel inputs for applications utilizing three wire RTD sensors**

- **Built-in Altitude Control capability for both 0 - 15 PSIA or 0 - 20 PSIA 4-20 ma Sensors providing direct readout of altitude in 100 ft. increments**

- **250 ms. update rates on each control channel for quick control response**

- **Each of the three control loops has the following features:**

  - **Control Outputs:**   **Lo Heat**
                              Hi Heat (Adjustable staging)
                              Lo Cool
                              Hi Cool (Adjustable staging)

                   Configurable as: **Time Proportioning**
                                               Burst Firing
                                               Analog output

  - **Compressor Bypass**

  - **MTO (Machine Time Out) with adjustable parameters for:**

    % Cool Demand and Seconds ON time to start MTO
    Pre Cool MTO start

    Short Cycle protection in delay seconds.   % Heat Demand for turning OFF the MTO in % Heat and Seconds.

  - **Hi Process Value Limit - Hi trip point and hysteresis**

  - **Low Process Value Limit - Low trip point and hysteresis**

  - **Hi Limit for Increase (heat) % control output power and hysteresis**

  - **Low Limit for Increase (heat) % control output power and hysteresis**

  - **Hi Limit for Decrease (cool) % control output power and hysteresis**

  - **Low Limit for Decrease (cool) % control output power and hysteresis**

  - **Pre-Heat output**

  - **Pre-Cool output**

- **Output functions common to all three channels:**

  - **8 Separate Programmable Events**

  - **Program Running Indication**

  - **End of Program reached (program complete)**

- Alarm Condition exists

- Positive programmable deviation exceeded

- Negative programmable deviation exceeded

- Setpoint Range exceeded

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JC SYSTEMS MODEL 2020 FastTRAC CONTROL SYSTEM

| Analog input 1(TC, RTD, ma, V) |
| Analog input 2 (TC, RTD, ma, V) |
| Analog input 3 (TC, RTD, ma, V) |

3 CHANNELS DUAL CONTROL or FastTRAC + Channel 3

Ch 1

FastTRAC

Ch 2

Ch 3

OUTPUT PIN ASSIGNMENTS: FUNCTIONAL &LOGICAL (GATED BY) (OR)

FOR EACH CHANNEL:
LO HEAT
   (Analog, ON-OFF, Burst Fire)
HI HEAT (Staged)
   (Analog, ON-OFF, Burst Fire)
LO COOL
   (Analog, ON-OFF, Burst Fire)
HI COOL (Staged)
   (Analog, ON-OFF, Burst Fire)

BYPASS LO COOL
BYPASS HI COOL

MACHINE TIME OUT (MTO)

PRE HEAT
PRE COOL

HI PROCESS LIMIT
LO PROCESS LIMIT
HI SETPOINT LIMIT
LO SETPOINT LIMIT
HI LIMIT % INC PWR
LO LIMIT % INC PWR
HI LIMIT % DEC PWR
LO LIMIT % DEC PWR

PROCESS RETRANSMIT
SETPOINT RETRANSMIT

P.0P (OPEN INPUT)
SETPOINT RANGE EXCEED
POS. DEV LIMIT EXCEEDED
NEG. DEV LIMIT EXCEEDED

PROGRAM IS RUNNING
PROGRAM AT EOP
ANY ALARM CONDITION

EVENTS 1 THRU 8

| Input 1 |
| Input 2 |
| Input 3 |
| Input 4 |
| Input 5 |
| Input 6 |
| Input 7 |
| Input 8 |

INPUT PIN ASSIGNMENTS

FUNCTIONAL & LOGICAL

(GATED BY) (OR)

Programmer

RUN
STOP
RESET
RUN PRGM# STEP#

CLEAR LATCHED

CONDITIONAL INPUT

LOCK FRNT PANEL

HOLD PRGM CLOCK

KILL CH1 OUTPUTS
KILL CH2 OUTPUTS
KILL CH3 OUTPUTS
KILL ALL OUTPUTS

OR SELECTABLE

3 MANUAL SETPOINTS
8 MANUAL EVENTS

3 SETPOINTS

8 PROGRAMMABLE EVENTS

| 232 INTERFACE |
| 485 INTERFACE |
| LAN INTERFACE |

6 Line X 21 Character Vacuum Florescent Graphics Display

13 Button Snap-Dome Action Switch Array for Operator Input

| DIG 1 |
| DIG 2 |
| DIG 3 |
| DIG 4 |
| DIG 5 |
| DIG 6 |
| DIG 7 |
| DIG 8 |
| DIG 9 |
| DIG 10 |
| DIG 11 |
| DIG 12 |
| DIG 13 |
| DIG 14 |
| DIG 15 |
| DIG 16 |

16 DIGITAL OUTPUTS

| ANA 1 |
| ANA 2 |
| ANA 3 |
| ANA 4 |
| ANA 5 |
| ANA 6 |

6 ANALOG OUTPUTS

| VIR1 |
| VIR2 |
| VIR3 |
| VIR4 |
| VIR5 |
| VIR6 |
| VIR7 |
| VIR8 |
| VIR9 |
| VIR10 |

VIRTUAL OUTPUTS

10 Virtual Outputs fed back to Input Logic and Assignment Block

9/29/02