CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

Series 21 - Features and Options

INDEX

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

SERIES 21
STANDARD PROGRAMMABLE FEATURES
(REQUIRES ACCESS CODE)

1. ACCESS CODE PROTECTS FEATURES LISTED IN THIS SECTION FROM UNAUTHORIZED CHANGES.

2. ACCESS CODE IS CONTROLLED BY TRANSFORMER MANUFACTURER.
   1. CODE IS NORMALLY DEFINED BY CIMCO.
   2. CUSTOMER MAY SELECT CODE USING ANY COMBINATION OF FIVE NUMBERS.

3. CHANGE ALL "ON" SET-POINTS

4. CHANGE ALL DEAD-BANDS (MOVE OFF SET-POINTS UP AND DOWN)

5. FAN EXERCISER
   1. TURN FAN EXERCISER ON AND OFF (ASSOCIATES WITH 1's DECIMAL POINT ON DIGITAL DISPLAY)
   2. SELECT TIMES FROM ONE MINUTE TO TWO HOURS

6. MONITOR TEMPERATURE TRENDS AND RELAY "ON" TIME
   1. UP TO 25,500 HOURS WITH RESET OR AUTOMATIC ROLL-OVER
   2. FANS ON
   3. ALARM ON
   4. TRIP ON

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

SERIES 21
OPTIONAL COMMUNICATION FEATURES

1. VDC SIGNALS
    1. MAXIMUM TEMPERATURE OR
    2. ALL THREE TEMPERATURES
    3. FULL SCALE (0-250 DEGREES C)
    4. 0-1, 0-2.5, 0-5, AND 0-10 VDC

2. CURRENT LOOPS
    1. MAXIMUM TEMPERATURE OR
    2. ALL THREE TEMPERATURES
    3. FULL SCALE (0-250 DEGREES C)
    4. 0-1, 0-10, 0-20, AND 4-20 milli-amp

3. REMOTE MONITORING USING RS-485 - REFERENCE DRAWING 10-21-96-H (pages 9 and 10)
    1. CIMCO INSTRUMENTS TO REMOTE COMPUTER (DOS)
        1. SOFTWARE SUPPLIED BY CIMCO
        2. UP TO 250 INSTRUMENTS
    2. RS-485 UP TO 4,000 FEET - TWO WIRE TWISTED PAIR

4. CONVERTER - RS-485 TO RS-232C (REQUIRED FOR CONNECTION TO MOST COMPUTERS)

5. REMOTE MONITORING USING RS-232C - REFERENCE DRAWING 10-21-96-H (pages 9 and 10)
    1. ONE CIMCO INSTRUMENT WITH SOFTWARE FOR REMOTE COMPUTER (DOS)
    2. UP TO 200 FEET - FOUR WIRE TWISTED

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

SERIES 21
OPTIONAL FEATURES

1. CHOICE OF TEMPERATURE SENSORS
   1. TYPE E THERMOCOUPLE
   2. 100 OHM RTD
   3. 1000 OHM RTD (NOT RECOMMENDED)

2. NUMBER OF WINDING TEMPERATURE SENSORS
   1. ONE SENSOR FOR LOWER COSTS OR
   2. THREE SENSORS

3. FOURTH SET-POINT RELAY - FORM C
   1. NOT FAIL-SAFE
   2. OPERATES WITH CURRENT HIGHEST TEMPERATURE OR
   3. WITH TRIP RELAY.
   4. STATUS LIGHT IS 100's DECIMAL POINT

4. FIFTH SET-POINT RELAY - FORM C
   1. FAIL-SAFE
   2. CAN OPERATE WITH ALARM SET-POINTS OR
   3. CAN OPERATE WITH FANS SET-POINTS OR
   4. WITH CURRENT HIGHEST TEMPERATURE
   5. STATUS LIGHT IS 10's DECIMAL POINT

5. COMMUNICATIONS - SEE DRAWING 9-21-96-B (pages 2 and 3)

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

OPTIONAL RELAY INSTRUCTIONS

1. GENERAL INFORMATION FOR OPTIONAL RELAYS
    1. FOURTH AND FIFTH SET-POINT RELAYS HAVE FORM C CONTACTS.
    2. CONTACT SPECIFICATIONS ARE ON CIMCO DRAWING 10-21-96-G (Specifications Document, page 5).
    3. TEMPERATURE ON SET-POINTS ARE PROGRAMMABLE.
    4. TEMPERATURE OFF SET-POINTS ARE PROGRAMMABLE.
    5. PROGRAMMING INSTRUCTIONS ARE ON CIMCO DRAWING 10-21-96-B (Programming Instructions, pages 2-4).

2. FOURTH SET-POINT RELAY
    1. SPECIFICATION IDENTIFICATION IS “A”.
    2. THREE TERMINAL BLOCK CONNECTIONS ARE LOCATED ON THE BACK, TOP, LEFT SIDE OF THE INSTRUMENT.
    3. RELAY IS NOT FAIL-SAFE.
    4. RECOMMENDED APPLICATIONS ARE
        1. SECOND TRIP RELAY OR
        2. INDEPENDENT RELAY OPERATION ABOVE 50 DEGREES C.

3. FIFTH SET-POINT RELAY
    1. SPECIFICATION IDENTIFICATION IS “B”.
    2. THREE TERMINAL BLOCK CONNECTIONS ARE LOCATED ON THE BACK, MIDDLE, RIGHT SIDE OF THE INSTRUMENT.
    3. RELAY IS FAIL-SAFE.
    4. RECOMMENDED APPLICATIONS ARE
        1. FANS ON RELAY OR
        2. INDEPENDENT RELAY OPERATION ABOVE 50 DEGREES C OR
        3. STATUS RELAY ASSOCIATED WITH ONE OR MORE OF THE FOLLOWING CONDITIONS:
            1. LOSS OF POWER TO INSTRUMENT
            2. MICRO-CONTROLLER FAILURE
            3. INSTRUMENT FAILURE

4. FOURTH AND FIFTH SET-POINT RELAYS
    1. SPECIFICATION IDENTIFICATION IS “C”.
    2. ORDERS OPTION A AND B ON THE SAME INSTRUMENT.
    3. APPLICATIONS ARE THE SAME AS LISTED FOR OPTIONS “A” AND “B”.

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

OPTIONAL CURRENT LOOP INSTRUCTIONS

1. GENERAL INFORMATION FOR OPTIONAL CURRENT LOOPS
    1. CURRENT LOOP SIGNALS ARE LINEAR FROM ZERO TO 250 DEGREES C.
    2. CURRENT LOOP SIGNALS ARE INTENDED FOR LOW IMPEDANCE LOADS.
    3. CIMCO's STANDARD CURRENT LOOP CALIBRATION IS WITH 100 OHM LOAD.
    4. CALIBRATION WITH DIFFERENT LOADS IS AVAILABLE UPON REQUEST.
    5. FIELD CALIBRATION IS NORMALLY AVAILABLE WITH REMOTE MONITOR NOT SUPPLIED BY CIMCO.
    6. IF ONE CURRENT LOOP IS SPECIFIED, THE OUTPUT SIGNAL IS PROPORTIONAL WITH THE HIGHEST CURRENT OPERATING TEMPERATURE.
    7. IF THREE CURRENT LOOPS ARE SPECIFIED, THE THREE CURRENT LOOP OUTPUT SIGNALS ARE PROPORTIONAL WITH THE THREE INPUT TEMPERATURES.

2. ONE CURRENT LOOP
    1. SIGNAL IS PROPORTIONAL WITH CURRENT HIGHEST OPERATING TEMPERATURE.
    2. OUTPUT CONNECTION IS A TWO POINT TERMINAL BLOCK ON THE BACK, LOWER LEFT SIDE OF THE INSTRUMENT.
    3. CONNECTION CABLE AND REMOTE METER ARE NOT INCLUDED.
    4. FOR ONE 0-1 milli-amp CURRENT LOOP; SPECIFICATION IDENTIFICATION IS "D".
    5. FOR ONE 0-10 milli-amp CURRENT LOOP; SPECIFICATION IDENTIFICATION IS "E".
    6. FOR ONE 0-20 milli-amp CURRENT LOOP; SPECIFICATION IDENTIFICATION IS "F".
    7. FOR ONE 4-20 milli-amp CURRENT LOOP; SPECIFICATION IDENTIFICATION IS "G".
        1. ZERO DEGREES C IS EQUAL TO 4 MILLI-AMPS.
        2. 250 DEGREES C IS EQUAL TO 20 MILLI-AMPS.

3. THREE CURRENT LOOPS
    1. THE THREE OUTPUT SIGNALS ARE PROPORTIONAL WITH THE THREE INPUT TEMPERATURES.
    2. OUTPUT CONNECTIONS ARE THREE SETS OF TWO POINT TERMINAL BLOCKS ON THE BACK, LOWER LEFT SIDE OF THE INSTRUMENT.
    3. CONNECTION CABLES AND REMOTE METERS ARE NOT INCLUDED.
    4. FOR THREE 0-1 milli-amp CURRENT LOOPS; SPECIFICATION IDENTIFICATION IS "H".
    5. FOR THREE 0-10 milli-amp CURRENT LOOPS; SPECIFICATION IDENTIFICATION IS "I"
    6. FOR THREE 0-20 milli-amp CURRENT LOOPS; SPECIFICATION IDENTIFICATION IS "J".
    7. FOR THREE 4-20 milli-amp CURRENT LOOPS; SPECIFICATION IDENTIFICATION IS "K".
        1. ZERO DEGREES C IS EQUAL TO 4 MILLI-AMPS.
        2. 250 DEGREES C IS EQUAL TO 20 MILLI-AMPS.

4. FORMULA FOR CURRENT LOOP IS AS FOLLOWS
   CURRENT LOOP = (PRESENT DISPLAY TEMPERATURE X 16) + 4
   250

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

OPTIONAL VDC SIGNALS INSTRUCTIONS

1. GENERAL INFORMATION FOR OPTIONAL VDC SIGNALS
   1. VDC SIGNALS ARE LINEAR FROM ZERO TO 25O DEGREES C.
   2. VDC SIGNALS ARE INTENDED FOR HIGH IMPEDANCE LOADS.
   3. VDC SIGNAL STANDARD CALIBRATION IS WITH 10,000 OHM LOAD.
   4. CALIBRATION WITH DIFFERENT LOADS IS AVAILABLE UPON REQUEST.
   5. FIELD CALIBRATION IS NORMALLY AVAILABLE WITH REMOTE MONITOR NOT SUPPLIED BY CIMCO.
   6. IF ONE VDC SIGNAL IS SPECIFIED, THE OUTPUT SIGNAL IS PROPORTIONAL WITH THE HIGEST CURRENT OPERATING TEMPERATURE.
   7. IF THREE VDC SIGNALS ARE SPECIFIED, THE THREE VDC OUTPUT SIGNALS ARE PROPORTIONAL WITH THE THREE INPUT TEMPERATURES.

2. ONE VDC SIGNAL
   1. SIGNAL IS PROPORTIONAL WITH CURRENT HIGHEST OPERATING TEMPERATURE.
   2. OUTPUT CONNECTION IS A TWO POINT TERMINAL BLOCK ON THE BACK, LOWER LEFT SIDE OF THE INSTRUMENT.
   3. CONNECTION CABLES AND REMOTE METERS ARE NOT INCLUDED.
   4. FOR ONE 0-1 VDC SIGNAL; SPECIFICATION IDENTIFICATION IS “L”.
   5. FOR ONE 0-2.5 VDC SIGNAL; SPECIFICATION IDENTIFICATION IS “M”.
   6. FOR ONE 0-5 VDC SIGNAL; SPECIFICATION IDENTIFICATION IS “N”.
   7. FOR ONE 0-10 VDC SIGNAL; SPECIFICATION IDENTIFICATION IS “O”.

3. THREE VDC SIGNALS
   1. THE THREE OUTPUT SIGNALS ARE PROPORTIONAL WITH THE THREE INPUT TEMPERATURES.
   2. OUTPUT CONNECTIONS ARE THREE SETS OF TWO POINT TERMINAL BLOCKS ON THE BACK, LOWER LEFT SIDE OF THE INSTRUMENT.
   3. CONNECTION CABLES AND REMOTE METERS ARE NOT INCLUDED.
   4. FOR THREE 0-1 VDC SIGNALS; SPECIFICATION IDENTIFICATION IS “P”.
   5. FOR THREE 0-2.5 VDC SIGNALS; SPECIFICATION IDENTIFICATION IS “Q”.
   6. FOR THREE 0-5 VDC SIGNALS; SPECIFICATION IDENTIFICATION IS “R”.
   7. FOR THREE 0-10 VDC SIGNALS; SPECIFICATION IDENTIFICATION IS “S”.

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

OPTIONAL
COMPUTER COMMUNICATIONS
INSTRUCTIONS

1. GENERAL INFORMATION
   1. RS-232 SIGNALS ARE LIMITED IN LENGTH TO 200 FEET.
   2. RS-485 IS LIMITED IN LENGTH TO 4000 FEET WITH TWISTED PAIR WIRES AND NO SHIELDING. SHIELDING REDUCES SIGNAL STRENGTH OVER LONG LENGTHS.
   3. RS-485 SIGNALS WITH SHIELDING AND TWISTED PAIR WIRES ARE GENERALLY LIMITED IN LENGTH TO 2000 FEET.
   4. MOST COMPUTERS ARE DESIGNED TO ACCEPT RS-232 SIGNAL AND CAN NOT ACCEPT RS-485 WITHOUT A NEW PRINTED CIRCUIT BOARD OR A CONVERTER.

2. RS-232C SIGNAL -- MODEL A21 TO REMOTE COMPUTER
   1. SPECIFICATION IDENTIFICATION IS “T”.
   2. SPECIFICATION “T” MODIFIES MODEL A21 WITH RS-232C TERMINAL BLOCK CONNECTION.
   3. CONNECTION CABLE BETWEEN MODEL A21 AND COMPUTER LOCATIONS IS NOT INCLUDED.
   4. CONNECTION CABLE MUST BE THREE WIRE PLUS SHIELDING.
   5. CABLE TO RS-232 ADAPTER PLUG IS NOT INCLUDED.
   6. INCLUDES SOFTWARE.
   7. OPERATING INSTRUCTIONS ARE INCLUDED WITH THE SOFTWARE DISK.
   8. COMPUTER DISPLAY IS SHOWN ON CIMCO DRAWING 10-21-96-H (pages 9 and 10).

3. CIMCO’s RS-485 “CONVERTER PACKAGE”
   1. INCLUDES AN RS-485 TO RS-232 CONVERTER AND CONNECTION CABLES
   2. THIS CONVERTER CONNECTS BETWEEN THE COMPUTER KEY-BOARD AND THE COMPUTER. THEREFORE, NO EXTERNAL POWER IS REQUIRED TO OPERATE THE CONVERTER.
   3. RS-485 "CONVERTER PACKAGE" NOT INCLUDED UNLESS REQUESTED.

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

REMOTE COMPUTER DISPLAY FOR MONITORING SERIES 21 INSTRUMENTS

INSTRUMENT MONITOR PROGRAM FOR CIMCO ELECTRONICS, VERSION 1.1
USING SERIAL COMMUNICATIONS PORTS. COM 1
INSTRUMENT ADDRESS: 0
INSTRUMENT TYPE: SERIES 21/22

	CURRENT TEMP.	MAX. TEMP IN MEMORY	OPEN SENSOR
LEFT PHASE:	0	0	NO
CENTER PHASE:	0	0	NO
RIGHT PHASE:	0	0	NO
AMBIENT:	0		

	FANS	ALARM	TRIP	FOURTH	FIFTH
RELAY STATUS:	OFF	OFF	OFF	OFF	OFF
ON SET-POINT:	0	0	0	0	0
OFF SET-POINT:	0	0	0	0	0
TOTAL RUN TIME:	0	0	0		

FAN MODE: blank

COMMUNICATIONS STATE: NOT REPLYING

ERRORS ENCOUNTERED: 1 ERRORS

LAST MESSAGE: REMOTE SENT BACK BAD FORMAT ON MESSAGE

ACTION MENU:

1. CHANGE CURRENT ADDRESS SETTING
2. QUIT THE PROGRAM (PRESS ESC)

CIMCO ELECTRONICS, INC.
www.cimcoelectronics.com
E-MAIL: cimco@cimcoelectronics.com

26 MAIN STREET, P.O. BOX 248
WEST MIDDLESEX, PA 16159
PHONE (724) 528-9559
FAX (724) 528-1108

REMOTE COMPUTER DISPLAY FOR MONITORING
SERIES 21 INSTRUMENTS
NOTES

1. DISPLAY ON PREVIOUS PAGE IS CONDITION WITHOUT CIMCO's INSTRUMENT CONNECTED TO REMOTE COMPUTER
    1. VERIFIES ACCEPTANCE OF CIMCO's OPERATING SOFTWARE BY REMOTE COMPUTER.
    2. NO INPUT FROM REMOTE CIMCO INSTRUMENT.
    3. FOLLOWING ITEMS ARE IN SEQUENCE OF SCREEN FROM TOP TO BOTTOM.

2. REMOTE COMPUTER OPERATOR MUST SELECT:
    1. COM PORT. CHOICES ARE COM 1, 2, 3 OR 4.
    2. INSTRUMENT ADDRESS FOR CIMCO INSTRUMENT AT TRANSFORMER LOCATION.

3. TEMPERATURE AND SENSOR MONITORING FEATURES ARE:
    1. CURRENT OPERATING TEMPERATURE OF EACH PHASE.
        1. ZERO IS NORMAL START-UP WHEN
        2. INSTRUMENT IS NOT CONNECTED TO REMOTE COMPUTER.
    2. CURRENT MAXIMUM TEMPERATURE OF EACH PHASE
        1. IN LOCAL INSTRUMENT MEMORY
        2. ZERO IS NORMAL START-UP WITHOUT INSTRUMENT CONNECTION.
    3. CONDITION OF TEMPERATURE SENSOR.
        1. NO; INDICATES SENSOR IS NOT OPEN. NOT OPEN IS NORMAL OPERATION.
        2. YES; INDICATES SENSOR IS OPEN.
            1. SENSOR IS NOT CONNECTED OR
            2. SENSOR IS DEFECTIVE.

4. RELAY MONITORING; MONITORS UP TO FIVE RELAYS (FOURTH AND FIFTH ARE OPTIONAL)
    1. RELAY STATUS; OFF IS DISPLAY WHEN INSTRUMENT IS NOT CONNECTED
        1. ON; INDICATES RELAYS HAVE BEEN TURNED ON DUE TO SET-POINT ACTION.
        2. OFF; INDICATES RELAYS HAVE BEEN TURNED OFF DUE TO SET-POINT ACTION.
    2. ON SET-POINT; DISPLAYS THE PROGRAMMED ON TEMPERATURE FOR THE RELAY.
    3. OFF SET-POINT; DISPLAYS THE PROGRAMMED OFF TEMPERATURE FOR THE RELAY.
    4. TOTAL RUN TIME; DISPLAYS THE TOTAL TIME THE RELAYS HAVE BEEN TURNED ON.
        1. MAXIMUM RUN TIME IS 25,500 HOURS
        2. INSTRUMENT PROGRAM RESETS TO ZERO AFTER 25,500 HOURS
        3. NOT AVAILABLE FOR FOURTH AND FIFTH SET-POINTS
    5. FAN MODE:
        1. BLANK; INDICATES INSTRUMENT IS NOT CONNECTED
        2. AUTO, ON, or OFF INDICATES SELECTION BY INSTRUMENT OPERATOR.

5. COMPLETE INSTRUCTIONS ARE INCLUDED WITH THE SOFTWARE DISK.