SC-7400 Universal 4-Wire Transmitter/Alarm DIN Rail / Surface Mount

Instruction Manual

RIS
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SCIENTIFIC COLUMBUS

Rochester Instrument Systems, Inc.
255 North Union Street
Rochester, New York 14605

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Section 1 - Hardware Information

The **SC-7400** family of four-wire transmitter/alarm signal conditioning products are field rangeable and fully configurable with a Hand Held Communicator (HHC) or direct connection to a Personal Computer (PC). The **SC-7400** will accept a wide variety of process inputs of mV, V, T/C, mA, RTD's, ohms and slidewires. The input circuitry is designed for intrinsic safety, although not all units are available in intrinsically safe versions. Intrinsic safety reduces the risk of ignition by electrical apparatus or connecting wiring in hazardous locations. Output ranges are also selectable for each model. All input/output ranging is done through the front access connector with a HHC or PC.

The units are compact, lightweight and provide space-saving mounting. The **SC-7400** transmitters are mountable on standard DIN rail or can be surface mounted. The power supply is jumper selectable for a wide range of power sources.
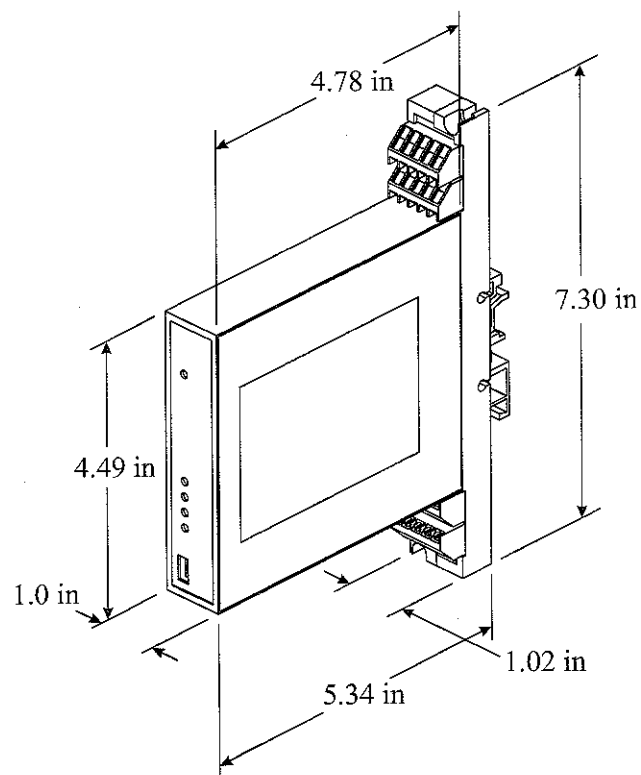
Figure 1 - SC-7400 Dimensions

Available Models

The following is a list of the available **SC-7400** models. The N after the model number denotes non-intrinsically safe model and the I indicates intrinsically-safe model.

Model Number	Output Type
SC-7401-N	Single analog output
SC-7401- I	Single analog output, intrinsically safe input
SC-7402-N	Dual analog output
SC-7402-I	Dual analog output, intrinsically safe input
SC-7402-N-100	Dual analog output, 0 -100 mV fixed input
SC-7403-N	Single trip/alarm output
SC-7403-I	Single trip/alarm output, intrinsically safe input
SC-7404-N	Dual trip/alarm output
SC-7404-I	Dual trip/alarm output, intrinsically safe input
SC-7405-N	Single analog and single trip/alarm output
SC-7405-I	Single analog and single trip/alarm output, intrinsically safe input.

Installation

Installation personnel should have a general electrical and mechanical maintenance background. Installation of this equipment does not require special training or equipment, however standard instrumentation installation practices must be observed.

Unpacking

Upon receipt of the equipment, perform the following procedures:

- Check all containers for signs of external damage. Look for scratches, protrusions, holes, smashed corners or rattles.

- Ensure that the container is sealed. If any container is open, notify the carrier and record it on the freight bill.

- Open the container and check the contents against the respective packing list.

- Save all packing containers and materials for possible reshipment.

Inspection

- Inspect the outside of the equipment for damage such as scratches, dents, cracks, etc.

- Record any damaged, missing or incorrect items. Immediately notify the carrier and *RiS Technical Support. RiS Technical Support* phone number is located on the cover page of this manual.

!CAUTION!

DO NOT Attempt to install equipment with obvious signs of physical damage. Contact your *RiS After Market Services Representative.*

Repacking for Shipment

If the instrument is to be shipped to *Rochester Instrument Systems, Inc.* for service or repair:

1   Call *RiS Repair Sales* and obtain an Return Material Authorization (RMA) number.

2   Attach a tag to the instrument identifying the owner and indicating the service or repair to be made. Include the model number and full serial number of the instrument.

3   In all correspondence, identify the instrument by model number and full serial number. Serial tag is located on the housing.

4   Place the instrument in original container with appropriate packaging material and secure with strong tape.

If the original container is not used, do the following:

- Wrap the instrument in static resistant plastic before placing in an inner container.

- Place packing material around all sides of the instrument and cushion it with cardboard strips.

- Place the instrument in the inner container in a heavy carton and seal with strong tape.

- Mark shipping container "DELICATE INSTRUMENT", "FRAGILE", etc.

- Mark the RMA number on the outside of the package.

Mounting

The **SC-7400** units can be mounted on a standard DIN rail or can be surface mounted. A template is provided for easy mounting. For 240 Vac mains service, allow 1/8" spacing between units for proper ventilation. The template is located at the end of this manual on the same page as the registration card. For DIN rail mounting the backplane snaps onto the DIN rail. For surface mounting use #6 hardware to attach the backplane to the surface. To connect the unit to the backplane insert the bottom of the connector first and rotate the unit upwards. Refer to **Figure 2**.

For your convenience two blank labels are provided. The labels can be used on the top and front of the unit. The top label adheres to the top of the transmitter case. The front label is positioned over the front connector opening. Record your configuration information or any other pertinent information on these labels. The labels can be removed and reused as needed.

Figure 2 - DIN Rail Mount

#6 SCREW

7.30 in

1.02 in

MOUNTING HOLES
FOR #6 HARDWARE

TB1
TB2

7.15 in

MOUNTING HOLE
PATTERN

TB3
TB4

0.67 in
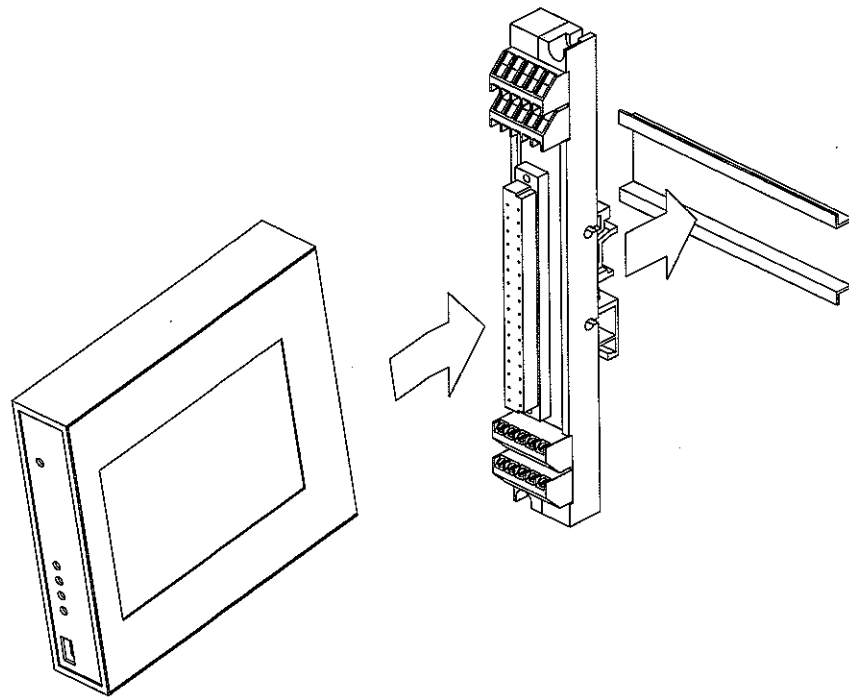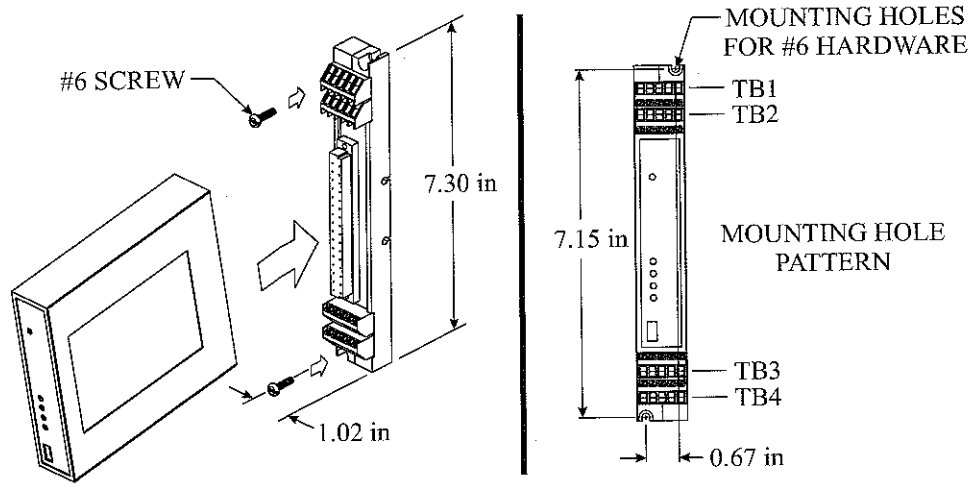
Figure 3 - Surface Mount

Jumper Selections for Power Supply

The **SC-7400** is jumper selectable for a wide range of power sources. Acceptable supply voltages are 24 Vdc, 48 Vdc, 110 (125) Vdc, 120 Vac, and 240 Vac. To access the jumpers, disconnect the unit from the backplane by pulling the unit in a downward rotation as shown in **Figure 4**. The jumpers are located adjacent to the connector, as shown in **Figure 5**.
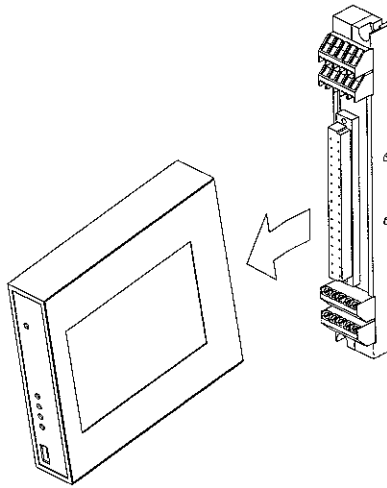
Figure 4 - Jumper Location

The jumper settings for the power supply voltages are labeled above the connector inside the transmitter. Place the two jumpers (provided) on the corresponding pins. The illustration shows the jumpers on pins 1 and 4 indicating a selection of 24, 48, and 110 (125) Vdc as the power supply.
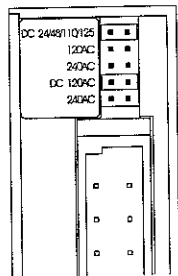
Voltage	Jumper Selection Guide
24, 48, 110 (125) Vdc	1 + 4
120 Vac	2 + 4
240 Vac	3 + 5

Figure 5 - Jumper Setting for DC Voltages

Wiring Recommendations

The following diagram shows the location of the terminal blocks and LED's.
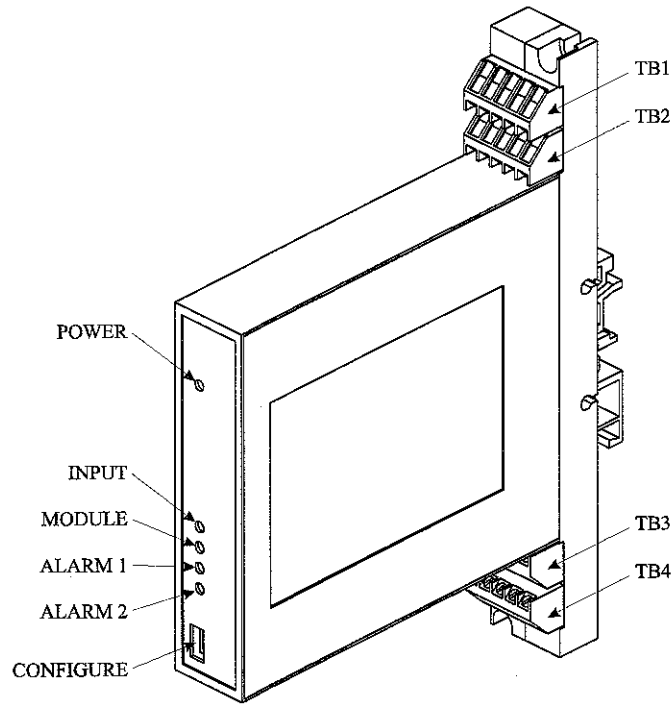
Figure 6 - Terminal Block and LED Locations

LED Indicator	Function
Power	Green LED (on = OK)
Input (Sensor)	Green LED (on = OK)
Module (CPU)	Green LED (on = OK)
Alarm 1	Red LED (on = alarm)
Alarm 2	Red LED (on = alarm)

Noise Reduction

Use the following recommendations to reduce noise effects with the **SC-7400** family of transmitters.

- Use standard instrumentation installation practices.

- Use shielded wire for all analog signals, input and output.

- For the best noise rejection, it is recommended that you wire the input as shown in **Figure 7**.

- **Figure 8** is the recommended output wiring diagram.
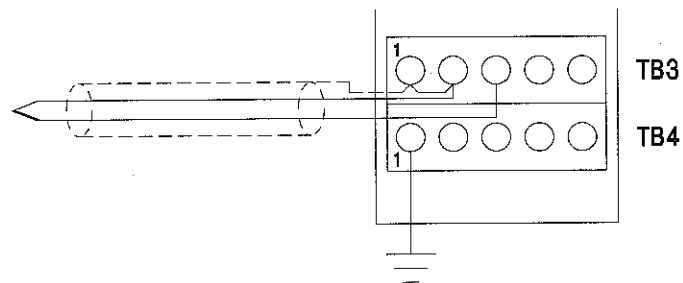
Figure 7 - Input Wiring
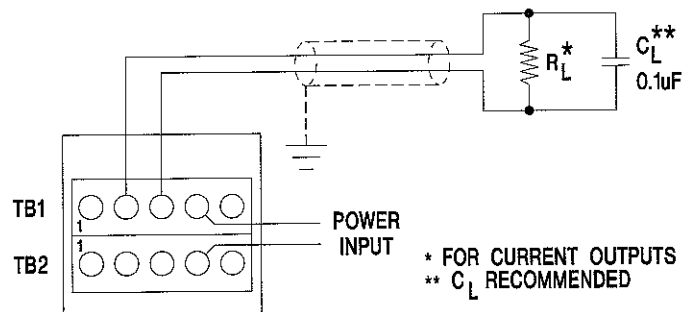
Figure 8 - Output Wiring

Input Connection Diagrams

Use the following diagrams for connecting the desired input. For installation in hazardous locations see drawing 1072-477.

2-WIRE OHM, RTD:
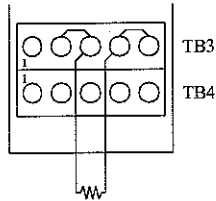
SC-7400-N   SC-7400-I
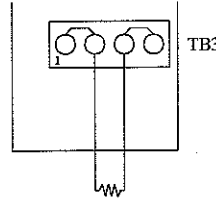
3-WIRE OHM, RTD:
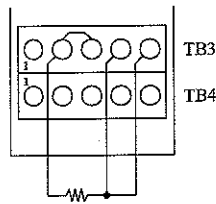
SC-7400-N   SC-7400-I
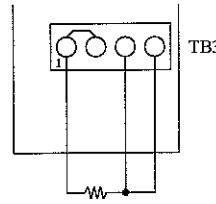
4-WIRE OHM, RTD:
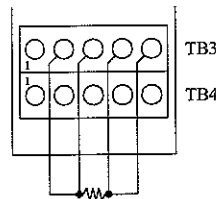
SC-7400-N   SC-7400-I
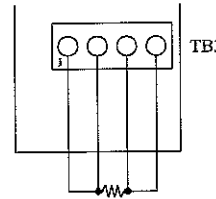
SLIDEWIRE:

SC-7400-N   SC-7400-I
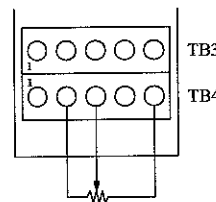
NOT AVAILABLE

Figure 9 - Input Diagrams

3-WIRE DIFFERENTIAL RTD:

SC-7400-N   SC-7400-I

T = T1 - T2

CURRENT:

SC-7400-N   SC-7400-I

NOT AVAILABLE

MV T/C:

SC-7400-N, -100   SC-7400-I

VOLTS:

SC-7400-N   SC-7400-I

NOT AVAILABLE
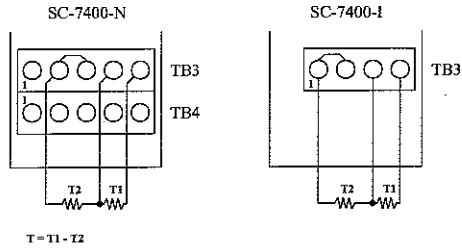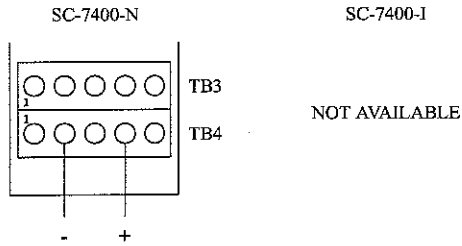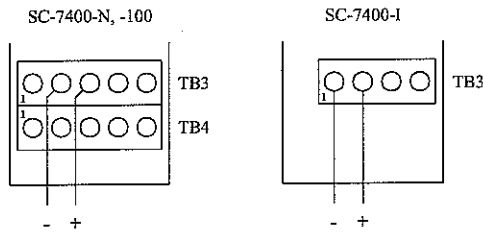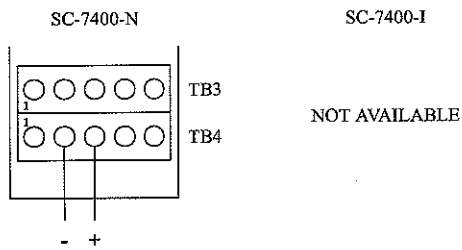
Figure 10 - Input Diagrams

Output Connection Diagrams

Use the following diagrams for connecting the desired output. For installation in hazardous locations see drawing 1072-477.

SC-7401-N, SC-7402-N,
SC-7401-I, SC-7402-I:

OUTPUT 1   POWER

L2/N (-)
L1 (+)

TB1   * JUMPER TB1-1 TO TB1-2 AND TB2-1 TO TB2-2
FOR VOLTAGE OUTPUTS ONLY

TB2

OUTPUT 2
(SC-7402-N, SC-7402-I ONLY)
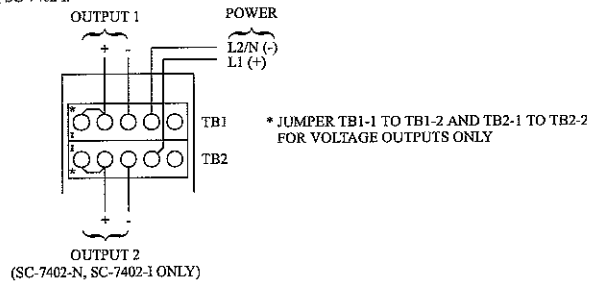
SC-7403-N, SC-7404-N,
SC-7403-I, SC-7404-I:

OUTPUT 1   POWER

L2/N (-)
L1 (+)

TB 1

TB 2   NOTE: RELAYS SHOWN IN
DE-ENERGIZED STATE.

OUTPUT 2
(SC-7404-N, SC-7404-I ONLY)

SC-7405-N, SC-7405-I:

OUTPUT 1   POWER

L2/N (-)
L1 (+)

TB 1   * JUMPER TB1-1 TO TB1-2
FOR VOLTAGE OUTPUTS ONLY

TB 2   NOTE: RELAYS SHOWN IN
DE-ENERGIZED STATE.
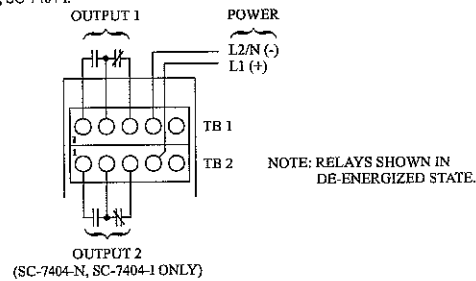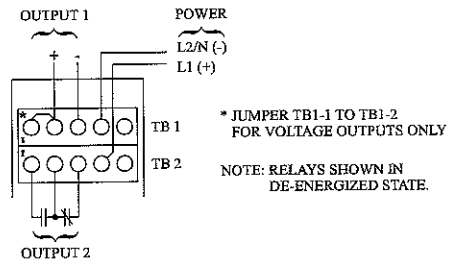
OUTPUT 2

Figure 11 - Output Diagrams

Specifications

Indicators: Power - Green LED.
                                     Input sensor - Green LED (on = OK).
                                     Module CPU Operation - Green LED (on = OK).
                                     Alarm 1 - Red LED (on = alarm).
                                     Alarm 2 - Red LED (on = alarm).

Power Supply: Jumper selectable for 24 Vdc, 48 Vdc, 110 Vdc,
                                     120 Vac, or 240 Vac 50/60 Hz nominal.

Input Signals:[1]

   Volt (Non IS Models):[1]   0 to 1V, 0 to 5V, 0 to 10V, 1 to 5V, 0 to XV
                                     (special factory configuration X=20 to 200V,
                                     30V maximum for CSA)

   Current (Non IS Models):[1]   0 to 1 mA, 0 to 5 mA, 1 to 5 mA, 0 to 10 mA,
                                     0 to 20 mA, 4 to 20 mA, 10 to 50 mA, 0 to 5
                                     mA Bipolar, 0 to 10 mA Bipolar

   mV (All Models):[1]   -15 to +85 mV absolute operating range.
                                     Zero and span may be set anywhere within
                                     range. 4 mV minimum span.

   T/C (All Models):[1]   Software configurable for linearized or non-
                                     linearized output.

T/C Type	Range °C	Min/Max Span
NIST J	-180 to 760	110 to 940
NIST K	-180 to 1300	140 to 1480
NIST E	-150 to 1000	90 to 1150
NIST R	0 to 1600	450 to 1600
NIST S	0 to 1600	480 to 1600
NIST T	-200 to 400	160 to 600
NIST B	300 to 1800	650 to 1500
DIN J	-200 to 900	110 to 1100
DIN T	-200 to 600	160 to 800
BS N (AWG 14)	0 to 1300	140 to 1300

1   SC-7402-N-100 does not have a configurable input. The input is factory set at 0 - 100
mV.

Ohms - 3 or 4 wires (All Models):	0 to 500 Ω absolute operating range. Zero and span may be set anywhere within range. 50 Ω minimum span
RTD - 2, 3 or 4 wire, 3 wire differential for PT and Ni RTD, 2 wire only for Cu RTD (All Models):	100 ohm Pt α=0.003850, -200 to 850 °C min span = 50 °C 100 ohm Pt α=0.003916, -200 to 850 °C min span = 50 °C 100 ohm Pt α=0.003923, -200 to 650 °C min span = 50 °C 120 ohm Ni = -80 to 320 °C, min span 50 °C 10 ohm Cu = -200 to 260 °C, min span 460 °C
Slidewire (Non IS Models):	May be configured for 500 to 5000 ohm span based at zero ohms.
Analog Output Signals:	Software configurable current outputs: 0 - 1 mA 0 - 5 mA 0 - 10 mA 0 - 20 mA 4 - 20 mA Voltage Outputs configurable through software and external terminal block wire jumper (See Output Connection Diagrams) 0 - 1V 0 - 5V 1 - 5V 0 - 10V
Trip Outputs:	Form C relays, failsafe or non-failsafe. One or two available, depending on Model number.

Accuracy Related Factors

Input Accuracy:

mV:	±0.02% of reading ±0.005 mV, Linear with input
V:	±0.05% of reading ±0.6 mV, Linear with input
mA:	±0.05% of reading ±3.0 μA, Linear with input
ohms (3 and 4 wire):	±0.05% of reading ±0.03 ohm, Linear with input
Pt, Ni RTD (3 and 4 wire):	0.1% of reading ±0.1 °C, Linear with temp.
Cu RTD (2 wire):	±2.0 °C, Linear with temperature
Slidewire:	±0.1% of span, Linear with input
T/C:	Accuracy listed in table plus cold junction error

T/C Type	Range °C	Accuracy
NIST J	-180 to 760	± 0.3 °C
NIST K	-180 to 1300	± 0.5 °C
NIST E	-150 to 1000	± 0.3 °C
NIST R	0 to 500	± 1.0 °C
	500 to 1600	± 0.7 °C
NIST S	0 to 500	± 1.0 °C
	500 to 1600	± 0.7 °C
NIST T	-200 to 0	± 0.4 °C
	0 to 400	± 0.3 °C
NIST B	300 to 500	± 2.0 °C
	500 to 1800	± 1.0 °C
DIN J	-200 to 900	± 0.3 °C
DIN T	-200 to -100	± 0.4 °C
	-100 to 600	± 0.3 °C
BS N (AWG 14)	0 to 800	± 0.3 °C
	800 to 1300	± 0.5 °C

Cold Junction Error:	±0.5 °C
Non-Linearized T/C:	±0.02% of reading ±0.005 mV plus cold junction accuracy.
Repeatability:	0.05% of span

Analog Output Accuracy:

Range	Accuracy (% of span)
0 - 1 mA	± 0.5%
0 - 5 mA	± 0.1%
0 - 10 mA	± 0.05%
0 - 20 mA	± 0.05%
4 - 20 mA	± 0.05%
0 - 1V	± 0.5%
0 - 5V	± 0.1%
1 - 5V	± 0.1%
0 - 10V	± 0.05%

Tracking Accuracy (SC-7402 only):   4 to 20 mA ±0.5% max
                                     others ±1% typical

Trip Output Accuracy: ± 0.01% of span (Input Accuracy rating must be
                                     added to this figure to determine *overall* accuracy)

Operating Influences

Input Reference Conditions:

mV:	0 to 10 mV
T/C:	0 to 200 °C "J" T/C
RTD:	0 to 200 °C 100 Ω Platinum
Ohm:	0 to 100 Ω

Analog Output Reference Condition: 4 to 20 mA, 250 Ω load

Ambient Temperature:
    Nominal: 23 ± 1°C
    Operating Range: -20 to +70 °C *
    Storage Range: -40 to +85 °C
    Effect on Accuracy: +/- 0.005% / °C max.
            for Current Input   +/- 0.0075% / °C max.
            for Copper RTD Input   +/- 0.01% / °C max.
Effect on Cold Jct: +/- 0.015 °C / °C max.

Relative Humidity:
    Range: 25 to 95% non-condensing
    Effect on Accuracy: +/- 0.075% of span for a change in RH of
                                     25 to 95% at 23 °C

Vibration Effect:
    Range: A constant displacement of 1mm over a
                                     range of 5 to 15 Hz, an acceleration of
                                     5 m/s/s over the range of 15 to 150 Hz
    Effect on Accuracy: +/- 0.05% of span

Drop and Topple: +/- 0.05% of span

*   Derate to 60°C for 240 Vac operation.

| Output Load: | (Current outputs): +/- 0.05% of span for the following load changes: |
| | |

Range: Load:
1 mA   16000 Ω
5 mA   3200 Ω
10 mA   1600 Ω
20 mA   800 Ω

Output Resistance: (Voltage outputs): 1 kΩ +/- 1.0%

Common Mode Effect: 120 dB at 250 Vac 50/60 Hz

Normal Mode Effect: 40 dB with peak to peak signal within the unit's maximum input range

Supply Voltage
     Nominal: 24 Vdc, 48 Vdc, 110 Vdc, 125 Vdc
                         120 Vac 50/60 Hz, 240 Vac 50/60 Hz
     Range: +/- 15%
     Effect on Accuracy: +/- 0.05% of span over the range

Magnetic Field Effect: +/- 0.05% of span at 0.5 mT, 50/60 Hz

Electromagnetic Susceptibility: +/- 1% of span over the frequency range of 20 to 1000 MHz at a field strength of 10V/M.
± 2% of span over the frequency ranges of 50-55 MHz, 150 MHz, and 95-115 MHz at a field strength of 10 V/M
Tested to: SAMA PMC 33.1-1978

SWC Protection: Conforms to ANSI C37.90.1-1989 for oscillatory and high frequency disturbance withstand.
Conforms to IEC 801-4 Level 2

ESD (electric discharge):   IEC 801-2 level 3 (8kV), No permanent damage.

Analog Output Step Response:	For a step of 0 to 100% of span the 10 to 90% response time is less than 0.5 second. The response time from input change to 90% output change is less than 1 second.
Trip Output Step Response:	For a step of 0 to 100% and the delay set to zero the trip will occur within 0.5 second.
Contact Rating (trip outputs):	3A, 250 Vac resistive or 3A, 30 Vdc, 30W max.
Trip Range:	0.5 to 100% of span in 0.1% increments
Deadband:	0 to 20% of span in 1% increments
Delay:	1 to 120 seconds in 1 second increments
	Software configurable for trip level, deadband, failsafe or non-failsafe operation, high going or low going trip/alarm, trip/alarm delay, and response to input failure.

Input Impedance

T/C, mV:	Greater than 2 MΩ
mA:	50 Ω ± 5%
V:	500 KΩ ± 5%
RTD Excitation:	165 μA ± 10%

RTD Failure:

Open Lead:	Upscale
Shorted RTD:	Downscale
	INPUT (Sensor OK) LED turned off with sensor failure. Failure is defined as 5% over or under the selected input range or input channel out of range. Analog output is configurable for either upscale or downscale burnout. Trip output(s) are configurable for alarm if sensor failure.

T/C Burnout Current:	Less then 0.1 μA
T/C, mV, mA, V Failure:	Sensor OK LED turned off with sensor failure. Failure defined as ±5% over or under the selected input range or input channel out of range. Analog output configurable for either upscale or downscale burnout. Trip output configurable for alarm if sensor failure.
Dielectric Strength:	2.5 kVac 50/60 Hz from input to output/power/ground 1500 Vac from power to output/ground 1000 Vac between output and ground 1000 Vac between analog and relay outputs if applicable
Insulation Resistance:	Less than 5 MΩ at 500 Vdc after 1 minute
Leakage Current:	Less than 1 mA at 2500 Vac after 1 minute
Long Term Stability:	Less than 0.1% of span over 6 months
Warm Up:	Full accuracy within 5 minutes of power applied
Power Consumption: DC:	Nominal 2.5 W with one transmitter or trip output (transmitter output at 20 mA or relay on) Nominal 3.0 W with two outputs (same conditions)
120 Vac, 50/60 Hz:	Nominal 4 VA at a leading power factor
240 Vac, 50/60 Hz:	Nominal 25 VA at a leading power factor
Agency Approvals: SC-7400-I Series	CSA & FM Inputs Intrinsically Safe Class I, Division I, Groups A, B, C, & D Class II, Division I, Groups E, F, & G Class III, Installation - Class I, Division 2, Group A, B, C, & D
SC-7400-N Series	Installation - Class I, Division 2, Group A, B, C, & D

Alarm/Trip Output Operation

The following table provides examples of typical relay and LED responses; not all possibilities are shown. Depending upon how your SC-7400 is configured, you may see different results.

Input Failure Response:	Not Selected							
Failsafe:	Not Selected				Selected			
Burnout Mode:	Upscale		Downscale		Upscale		Downscale	
Output:	Relay	LED	Relay	LED	Relay	LED	Relay	LED
Normal State:	D	☼☼●●	D	☼☼●●	E	☼☼●●	E	☼☼●●
Alarm State:	E	☼☼☼☼	E	☼☼☼☼	D	☼☼☼☼	D	☼☼☼☼
>5% Over Range:	D	●☼●●	D	●☼●●	E	●☼●●	E	●☼●●
>5% Under Range:	D	●☼●●	D	●☼●●	E	●☼●●	E	●☼●●
Open Sensor:	D	●☼●●	D	●☼●●	E	●☼●●	E	●☼●●
Processor Failure:	D	☼●●●	D	☼●●●	D	☼●☼●	D	☼●☼●

Input Failure Response:	Selected							
Failsafe:	Not Selected				Selected			
Burnout Mode:	Upscale		Downscale		Upscale		Downscale	
Output:	Relay	LED	Relay	LED	Relay	LED	Relay	LED
Normal State:	D	☼☼●●	D	☼☼●●	E	☼☼●●	E	☼☼●●
Alarm State:	E	☼☼☼☼	E	☼☼☼☼	D	☼☼☼☼	D	☼☼☼☼
>5% Over Range:	E	●☼☼●	E	●☼☼●	D	●☼☼●	D	●☼☼●
>5% Under Range:	E	●☼☼●	E	●☼☼●	D	●☼☼●	D	●☼☼●
Open Sensor:	E	●☼☼●	E	●☼☼●	D	●☼☼●	D	●☼☼●
Processor Failure:	D	☼●●●	D	☼●●●	D	☼●☼●	D	●☼☼●

KEY
D = De-energized
E = Energized
☼ = LED on
● = LED off

LED Example:

Input	Module	Alarm1	Alarm2
☼	☼	●	●
on	on	off	off

1 - 20

Note: Model SC-7404 uses both Alarm1 and Alarm2 LEDs; all other models use Alarm1 only. The operation of Alarm LEDs is dependent upon the user's configuration settings. Alarm2 can be configured independent of Alarm1; see Section 2 or 3 of this manual for configuration information.

Troubleshooting

If you are experiencing difficulties with the *SC-7400*, check the following:

1   If the Power LED (green) is OFF:

- Is the module fully seated in the backplane?
- Are the power jumpers set for the appropriate range?
- Is the power supply voltage within the operating range?
- Contact *RiS Technical Support.*

2   If the Power LED and CPU (central processing unit) LED's are on, but the Input LED is off:

- Is the input within range?
- Is the unit properly configured?
- Contact *RiS Technical Support.*

3   If the Power LED is on but the CPU (central processing unit) LED is off, return the module for repair.
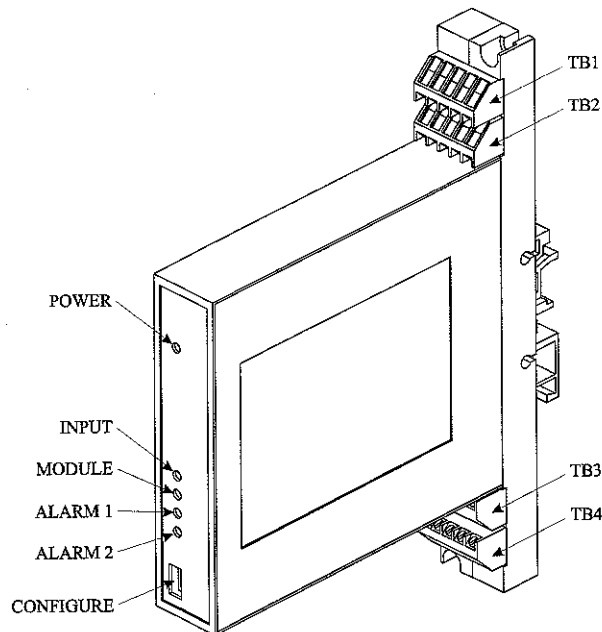
Figure 12 - LED Locations

Section 2 - Hand Held Communicator

Overview

This section provides the basic operating information for the Hand Held Communicator (HHC/74). The HHC/74 is used with the **SC-7400** family of universal transmitters to transfer data, perform transmitter configuration, and for inspection and maintenance functions. The communicator will automatically shut itself off after five minutes of inactivity to conserve battery power.
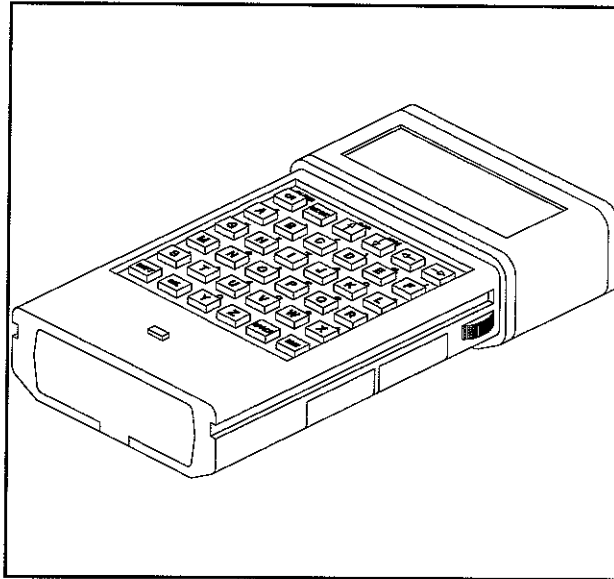
Figure 13 - Hand-Held Communicator (HHC/74)

An alphanumeric display provides an 80 character LCD screen in the form of 4 lines of 20 characters each. It has a variable contrast control located on the right side of the communicator. Programs are selected and initiated from menus.

The HHC/74 has an internal memory device A, and two external devices B and C which are the equivalent to the disc drives on a personal computer (See Figure 15). Each one can hold a Rampak, DataPak or Program Pak. The internal memory (A) of the HHC/74 holds about 31K RAM.

Powered by a 9V battery, the HHC/74 will display a "battery too low" message when the battery needs replacement. The message is displayed for 4 seconds and then the communicator will shut itself off.

Registration

Before continuing, take a minute to fill out the Registration card and return it to **Rochester Instrument Systems, Inc.** Returning this card ensures that you will receive update notices and entitles you to toll-free customer support. The registration card is located on the last page of this manual.

Getting Help

Even the most experienced user needs help on occasion. To make things easier for you, we provide several ways for you to get the instruction and help you need.

- Read the **SC-7400 HHC Communicator Section** of this Manual.

If you have exhausted all other help avenues and need help with your problem, contact *RiS Technical Support* at the numbers listed in the back of this manual.

Support is available Monday through Friday, from 8:15 a.m. to 5 p.m, Eastern Time.

Keyboard Functions
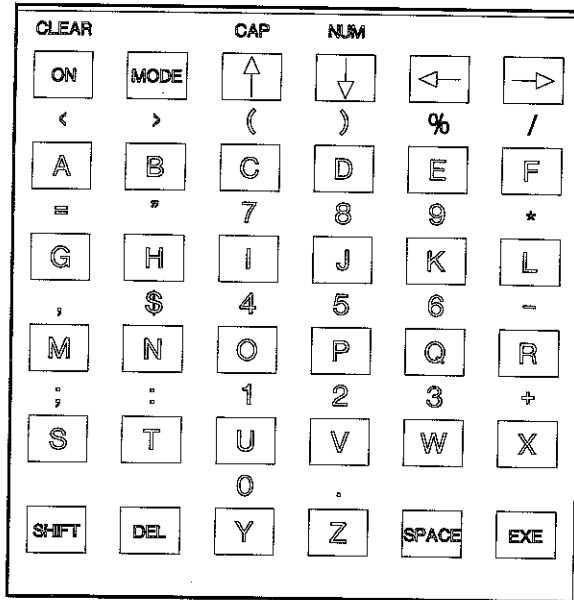
Figure 14 - HHC/74 Keyboard
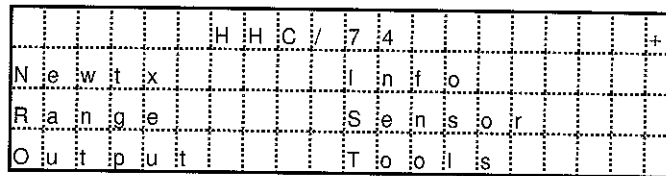
LCD Screen

The HHC/74 alphanumeric display provides an 80 character LCD screen in the form of 4 lines of 20 characters each (see LCD Screen above). The HHC/74 has a variable contrast control located on the right side of the communicator. Programs are selected and initiated from menus.

Menu selection is accomplished in two ways, either by moving the cursor with the arrow keys to the desired menu item or by selecting the first letter of the menu item you desire. If there is more than one menu item with the same first letter, selecting the letter again will move you to the next menu item with that first letter. Be sure to look for the + symbol in the upper right hand corner indicating that there are additional menu items. Some menus wrap around when you reach the first or last item.

Letter Keys

The letter keys normally produce capital (uppercase) letters on screen. When typing letters the cursor is a flashing block.

To type lowercase letters hold down SHIFT and press the CAP (↑) key.

To return to capital letters press SHIFT and the CAP (↑) again.

Numbers

When typing numbers the cursor is a line.

Hold down SHIFT and press a letter key to type the number or symbol marked above it.

By holding down SHIFT and pressing NUM (↓) the numbers and symbols keyboard is locked in. Return to letters by holding down SHIFT and pressing NUM (↓) again.

Dedicated Keys

- ON/Clear — Turns the unit ON and is used to back out of a menu selection.

- EXE — Selects menu items and executes functions.

- Arrow Keys — The arrow keys move the cursor Up/Down or Right/Left on the display screen.

- Del — To delete mistakes, position the cursor with the arrow keys and use the DEL key. DEL deletes the character to the left of the cursor. To delete the character under the cursor hold down SHIFT and then press DEL.

- MODE — This command will toggle you between the REVIEW mode and EDIT mode.

- OFF — To turn the HHC/74 OFF press ON/CLEAR from the main menu.

Note: If the unit is left on for five minutes without pressing any keys, it will turn itself off to conserve battery power. Press ON to return to the place where you left off.

There are two ways to use the Hand Held Communicator (HHC/74)

- you can communicate directly with the **SC-7400** family of transmitters
- you can use the PC to communicate with the HHC/74

The second method is useful for transferring previously built or stored configuration files.

The PC communicates with the HHC/74 via the Psion COMMS Link software and cable package. The Psion COMMS Link package is available as an optional purchase. Refer to the Psion documentation for installation and operation.

To communicate with the transmitter using the HHC/74 you must:

- Insert the HHC/74 Software Datapak

- Attach the SC-7411 cable between the **SC-7400** and the HHC/74

- Apply Power to the **SC-7400** transmitter

Insert the HHC/74 Program DataPak

Remove the cover from Device B and insert the Datapak. Device B and C are external devices located on the back of the communicator. Avoid pressing any key while inserting or removing a Datapak. TIP: Place the communicator face down on a flat surface.

- To insert a Datapak, push it into the slot until it clicks.

- To remove a Datapak, press down and out on the ribbed portion.

- Set the Time and Date. Refer to page 2-31.
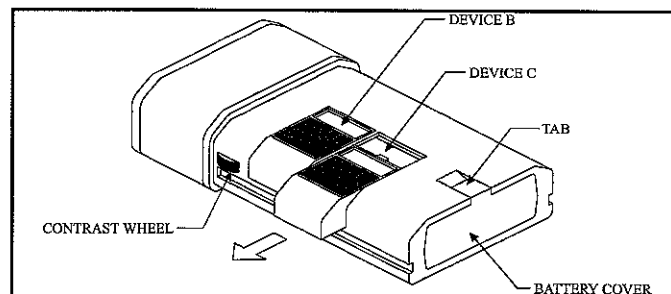
Figure 15 - Device B and C

Attach the Cable to the Communicator

Attach the **SC-7411 Cable** to the HHC/74 and the **SC-7400** unit. See Figure 16. The cable attaches to the communicator through a port located at the top of the HHC/74. Slide the port cover to the right revealing the port. Insert the interface module into the port, pushing until it clicks. The other end of the cable consists of a keyed probe that inserts into the front of the **SC-7400** transmitter.
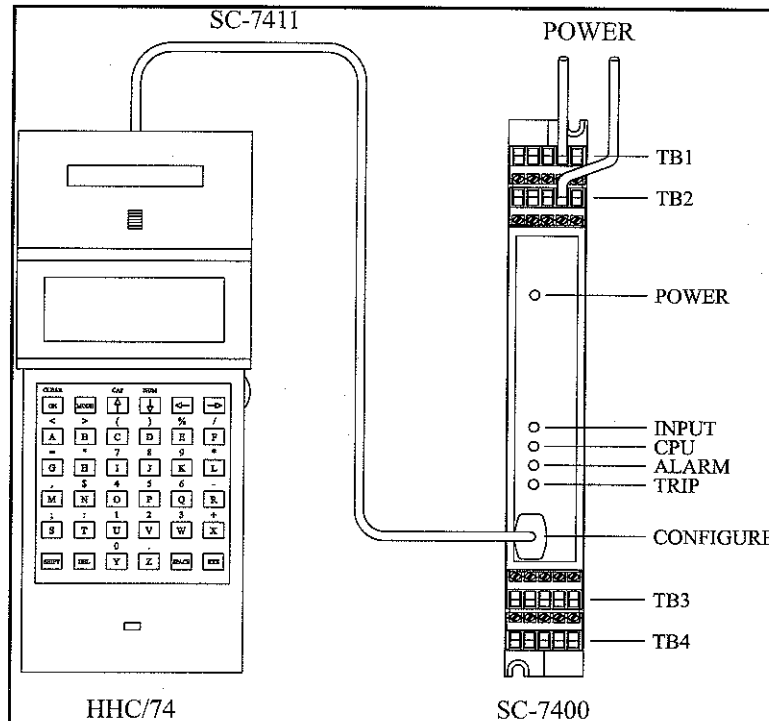
Figure 16 - Cable Connection of HHC/74 to SC-7400

Apply Power to the *SC-7400* Transmitter

Apply power to the **SC-7400** unit. Input power is jumper selectable, be sure to apply the proper power supply. See Section 1 for wiring diagrams and jumper selections.

Operating Functions

The following instructions are used to configure the *RiS SC-7400* family of transmitters.

1   Turn *ON* the communicator and the transmitter. Allow 10 seconds for the transmitter to stabilize.

2   The communicator may ask for your access code (password). If prompted, enter your access code and press **EXE**. The Main Menu for the *SC-7400* transmitter communications will be displayed.

All the menu screens, illustrated in this manual, show the full menu selections. Keep in mind that only four lines of the menu will be displayed at one time.

The + (plus) sign in the upper right hand corner of the screen indicates that there are additional menu items. To select these menu items use the down/up arrow keys or enter the first letter of the desired item.

```
                    H H C / 7 4                          +
N e w  t x              I n f o
R a n g e               S e n s o r
O u t p u t             T o o l s
U p l o a d             D o w n l o a d
P a s s w o r d
```

Main Menu

The remainder of this section is an explanation of each menu and its functions. The menus follow the main menu format and are not necessarily in sequential order. For a step-by-step sequential example see page 2-45.

Newtx establishes communications to the transmitter. Select *Newtx* from the HHC/74 Main Menu and press **EXE.** The communicator will display the following transmitter information.

					T	a	g		N	a	m	e							
					R	i	S		7	4	0	0							
	M	o	d	e	l	:	(										)		
P	r	e	s	s		S	P	A	C	E		t	o		c	o	n	t	

Transmitter Data

Press **SPACE** to continue. The transmitter information will be uploaded to the HHC/74 and the Main Menu screen will reflect the Tag Name and the Model # of the transmitter.

H	H	C	/	7	4		T	A	G	:		7	4	0	0			+
N	e	w	t	x				I	n	f	o							
R	a	n	g	e				S	e	n	s	o	r					
O	u	t	p	u	t			T	o	o	l	s						
U	p	l	o	a	d			D	o	w	n	l	o	a	d			
P	a	s	s	w	o	r	d											

Main Menu Screen

Info

The Info menu provides a variety of information about the transmitter. Select *Info* from the main menu and press **EXE**. The following information is displayed:

> Model #
> Serial #
> Tag
> Description
> Cal. Date
> Config. Date

You can change the tag name and the description. The description field is provided for additional information. Your description can be up to 20 characters in length. The Configuration Date is automatically updated with the current date. The Calibration Date and Serial Number are factory set and can not be changed.

							I	n	f	o								+
T	a	g	:															
M	o	d	e	l	#:													
S	e	r	i	a	l	#:												
D	e	s	c	r	i	p	t	i	o	n	:							
C	a	l			D	a	t	e										
C	o	n	f	i	g		D	a	t	e	:							

Info Screen

To change the *tag name* and *description*:

1 Press **MODE** to edit the tag name. Press ON to clear the current name and type in the desired name.

A tag name consists of up to 8 characters. All characters are valid for a tag name, however, filenames must start with a letter and use only letters and numbers, not symbols. Any illegal characters in the tag name will be converted to a "Z". Therefore, you may want your tag names to start with a letter and avoid illegal characters.

Example: Tag Name: 101:temp
File Name: z01ztemp

Select **EXE** to incorporate the changes.

2   The description screen allows the user to enter a 20 character description. To change the description press ON to clear the current description and type in the desired description. Select **EXE** to incorporate the changes. You will be returned to the Info screen.

> **Note:** If you are operating in the offline mode you have to choose the model number first before proceeding with the configuration.

3   Press **ON** to return to the Main Menu.

Range

The Range menu displays the current input range selections. This screen will vary depending upon the transmitter model number and the sensor type. Examples of each input type are explained below. Remember to select the sensor type before setting the range.

Select Range from the main menu and press **EXE**. The current range values will be displayed. To change the range values follow the directions below for your particular sensor type.

Millivolt Range

				R	a	n	g	e								
E	N	G		U	n	i	t	s	:	m	V					
L	o	w	e	r		V	a	l	:		-	1	5	.	0	0
U	p	p	e	r		V	a	l	:			8	5	.	0	0

mV Range Screen

To change the range:

1 Press **MODE**.

2 Enter the *Input for Low Output.* The operating range is -15.00 to +85.00 mV. Press **EXE.**

I	n	p	u	t		f	o	r		L	o	w		o	u	t	p	u	t
													-	1	0		m	V	
p	r	e	s	s		O	N		t	o		C	l	e	a	r			

3 Enter the *Input for Hi Output.* Press **EXE.**

I	n	p	u	t		f	o	r		H	i		O	u	t	p	u	t	
														4	0		m	V	
p	r	e	s	s		O	N		t	o		C	l	e	a	r			

4 Press **ON** to return to the Main Menu.

				R	a	n	g	e								
E	N	G		U	n	i	t	s	:		Ω					
L	o	w	e	r		V	a	l	:		0	.	0	0		
U	p	p	e	r		V	a	l	:		5	0	0	.	0	0

Ohms Range Screen

To change the range:

1   Press **MODE**.

2   Enter the *Input for Low Output.* The operating range is
0 to 500 Ω. Minimum span is 50 Ω. Press **EXE.**

I	n	p	u	t		f	o	r		L	o	w		O	u	t	p	u	t
															0		Ω		
p	r	e	s	s		O	N		t	o		C	l	e	a	r			

3   Enter the *Input for Hi Output.* Press **EXE.**

I	n	p	u	t		f	o	r		H	i		O	u	t	p	u	t	
													5	0	0		Ω		
p	r	e	s	s		O	N		t	o		C	l	e	a	r			

4   Press **ON** to return to the Main Menu.

				R	a	n	g	e								
E	N	G		U	n	i	t	s	:		C					
L	o	w	e	r		V	a	l	:		-	2	0	0	.	0	0
U	p	p	e	r		V	a	l	:		4	0	0	0	.	0	0

T/C Range Screen

To change the range:

1   Press **MODE**.

2   Select the desired temperature scale. Choices are: Celsius, Fahrenheit, Kelvin, and Rankine. Press **EXE**.

Note: Range information for Fahrenheit, Rankine and Kelvin is rounded to the nearest degree C. For example, 930°F input would be figured as follows:

$$930°F - 32 \ x \ \frac{5}{9} = 498.89°C$$

498.89°C is rounded to 499°C and sent to the unit. The actual number the unit is ranged for in degrees F is therefore 930.2° F.

$$499°C \ x \ \frac{9}{5} + 32 = 930.2°F$$

930.2° will be displayed on the HHC/74 when displaying the range information.

3   Enter the *Input for Low Output*. Press **EXE**.

I	n	p	u	t		f	o	r		L	o	w		O	u	t	p	u	t
														2	0	0		C	
p	r	e	s	s		O	N		t	o		C	l	e	a	r			

4 Enter the *Input for Hi Output.* Press **EXE**.

```
Input for Hi Output
                    500   C
press ON to Clear
```

5 Press **ON** to return to the Main Menu.

```
              R a n g e
E N G   U n i t s :    C
L o w e r   V a l :   - 8 0 .  0 0
U p p e r   V a l :    2 0 0 .  0 0
```

RTD Range Screen

To change the range:

1 Press **MODE**.

2 Select the desired temperature scale. Choices are: Celsius, Fahrenheit, Kelvin, and Rankine. Press **EXE**.

> **Note:** Range information for Fahrenheit, Rankine and Kelvin is rounded to the nearest degree C. For example, 930°F input would be figured as follows:
>
> $$930°F - 32 \ x \ \frac{5}{9} = 498.89°C$$
>
> 498.89°C is rounded to 499°C and sent to the unit. The actual number the unit is ranged for in degrees F is therefore 930.2° F.
>
> $$499°C \ x \ \frac{9}{5} + 32 = 930.2°F$$
>
> 930.2° will be displayed on the HHC when displaying the range information.

3 Enter the *Input for Low Output*. Press **EXE**.

```
I n p u t   f o r   L o w   O u t p u t
                         2 0 0 .   C
p r e s s   O N   t o   C l e a r
```

4   Enter the *Input for Hi Output.* Press **EXE.**

```
I n p u t     f o r     H i     O u t p u t
                                    5 0 0     C
p r e s s     O N     t o     C l e a r
```

5   Press **ON** to return to the Main Menu.

Milliamp Range

```
              R a n g e
E N G   U n i t s :     m A
L o w e r     V a l :     0 . 0 0
U p p e r     V a l :     5 0 .  0 0
```

Milliamp Range Screen

To change the range:

1   Press **MODE.**

2   Select the mA Input. Choices are: same, 0-20, 4-20, 0-1, 0-5, 0-10, 0-50 mA. Press **EXE.**

3   Press **ON** to return to the Main Menu.

Slidewire Range

```
            R a n g e
E N G   U n i t s :    Ω
L o w e r   V a l :    0 . 0 0
U p p e r   V a l :    5 0 0 0 . 0 0
```

Slidewire Range Screen

To change the range:

1   Press **MODE**.

2   Enter the Slidewire value. Press **EXE**.

3   Press **ON** to return to the Main Menu.

Voltage Range

```
            R a n g e
E N G   U n i t s :    V
L o w e r   V a l :    0 . 0 0
U p p e r   V a l :    1 0 . 0 0
```

Volt Range Screen

To change the range:

1   Press **MODE**.

2   Select the Volt Input range. Choices are: 0-1, 0-5, 0-10, and 1-5 volts. Press **EXE**.

3   Press **ON** to return to the Main Menu.

Sensor

The Sensor menu displays the sensor type, the upper and lower sensor limits in engineering units, and the minimum span.

Note: If configuring offline, you must specify the model number before setting up the sensor type.

The internal software will determine if the unit is an IS (intrinsically safe) or non-IS model. The screens will vary slightly for IS models.

Note: After selecting the sensor type, set the Range values.

Select Sensor from the Main Menu and press **EXE**. To change the sensor type follow the directions below for your particular sensor .

Millivolt Sensor

1   Press **MODE** to change the *sensor type*.

2   Select Millivolt. Press **EXE**. The following screen will be displayed.
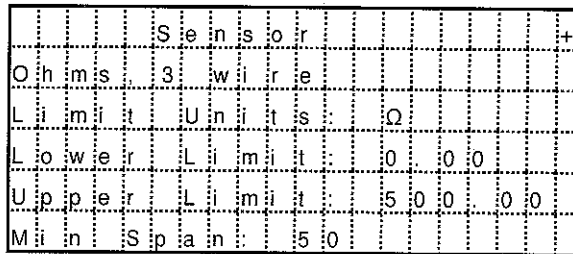
```
                    S e n s o r                          +
M i l l i v o l t s
L i m i t   U n i t s :    m V
L o w e r   L i m i t :     - 1 5 . 0 0
U p p e r   L i m i t      8 5 . 0 0
M i n   S p a n :    4 . 0 0
```
Millivolt Sensor Screen

3   Press **ON**.

4   Press **SPACE** to return to the Main Menu.

5   Proceed to the Range menu. The operating range is -15.00 to +85.00 mV. Zero and span may be set anywhere within this range. The minimum span is 4 mV.

1   Press **MODE** to change the *sensor type*.

2   Select Ohms.

3   Choose the resistance measure; three wire or four wire. Press **EXE.**

				S	e	n	s	o	r						+
O	h	m	s		3		w	i	r	e					
L	i	m	i	t		U	n	i	t	s	:		Ω		
L	o	w	e	r		L	i	m	i	t	:		0	.	0 0
U	p	p	e	r		L	i	m	i	t	:		5 0 0	.	0 0
M	i	n		S	p	a	n	:		5	0				

Ohms Sensor Screen

4   Press **ON.**

5   Press **SPACE** to return to the Main Menu.

6   Proceed to the Range menu. The operating range is 0 to 500 Ω. The zero and span can be set anywhere within the range. Minimum span is 50 Ω.

Thermocouple Sensor

1   Press **MODE** to change the *sensor type*.

			S	e	n	s	o	r							+
T	/	C	N	S	T		T	y	p	e		B			
L	i	m	i	t	U	n	i	t	s	:		C			
L	o	w	e	r	L	i	m	i	t	:		3	0	0 .	0 0
U	p	p	e	r	L	i	m	i	t	:		1	8	0 0 .	0 0
M	i	n	S	p	a	n	:		6	5	0 .	0 0			

T/C Sensor Screen

2   Select the thermocouple type. Press **EXE.**

3   Select the linearization type; same, millivolt or temperature. Press **EXE.**

4   Press **ON.**

5   Press **SPACE** to return to the Main Menu.

6   Proceed to the Range menu.

1   Press **MODE** to change the *sensor type*.

					S	e	n	s	o	r										+
P	t	1	0	0		∝	=	3	8	5										
L	i	m	i	t		U	n	i	t	s	:									
L	o	w	e	r		L	i	m	i	t	:									
M	i	n		S	p	a	n	:												

RTD Sensor Screen

2   Select RTD from the menu. Press **EXE.**

3   Select the RTD sensor type: PT100, Ni120, or Cu10. Press **EXE.**

4   Each sensor type requires a slightly different action.

- For the PT100 RTD select the alpha number: 385, 3916, or 3923. Press **EXE.** Choose the RTD measure - two wire, three wire, or four wire differential. Press **EXE.**

- For the Ni 120 RTD select the RTD measure - two wire, three wire, or four wire differential. Press **EXE.**

- For the Cu10 RTD you do not have to select anything.

5   Press **ON.**

6   Press **SPACE** to return to the Main Menu.

7   Proceed to the Range menu.

Milliamp Sensor

1   Press **MODE** to change the *sensor type*.

2   Select milliamp. Press **EXE.**

3   Press **ON.**

4   Press **SPACE** to return to the Main Menu.

5   Proceed to the Range menu.

Slidewire Sensor

1   Press **MODE** to change the *sensor type*.

2   Select slidewire. Press **EXE.**

3   Press **ON.**

4   Press **SPACE** to return to the Main Menu.

5   Proceed to the Range menu.

Voltage Sensor

1   Press **MODE** to change the *sensor type*.

2   Select volt. Press **EXE.**

3   Press **ON.**

4   Press **SPACE** to return to the Main Menu.

5   Proceed to the Range menu.

Output

The output(s) are programmed depending upon the model number (refer to list below).

Model Number	Output Type
SC-7401-N	Single analog output
SC-7401- I	Single analog output, intrinsically safe input
SC-7402-N	Dual analog output
SC-7402-I	Dual analog output, intrinsically safe input
SC-7402-N-100	Dual analog output, 0-100 mV fixed input
SC-7403-N	Single trip/alarm output
SC-7403-I	Single trip/alarm output, intrinsically safe input
SC-7404-N	Dual trip/alarm output
SC-7404-I	Dual trip/alarm output, intrinsically safe input
SC-7405-N	Single analog and single trip/alarm output
SC-7405-I	Single analog and single trip/alarm output, intrinsically safe input

A description of each model and its output(s) is described below.

Select *Output* from the Main Menu. Press **EXE**. The current output values will be displayed. To change the output values follow the directions below for the proper transmitter type.

Analog Output (SC-7401)


```
            Output
Channel     1:    Analog
Range:      0  -  10 V
Burnout:          Upscale
```

Analog Output Screen

1   Press **MODE**.

2   Select the analog output range. Range choices are 0-1 mA, 0-5 mA, 0-10 mA, 0-20 mA, 4-20 mA, 0-1 V, 0-5 V, 1-5 V, and 0-10 V. Press **EXE**.

3   Select the Burnout, either Upscale or Downscale. Press **EXE.**

4   Press **SPACE.**

5   Press **ON** to return to the Main Menu.

Two Analog Outputs (SC-7402)

Both outputs are identical for the dual analog output transmitter (SC-7402), therefore you only have to determine the output values once.

				O	u	t	p	u	t									
C	h	a	n	n	e	l		1	&	2		A	n	a	l	o	g	
R	a	n	g	e	:		0	-		1	0	V						
B	u	r	n	o	u	t	:		U	p	s	c	a	l	e			

Dual Analog Output Screen

1   Press **MODE.**

2   Select the analog output range. Range choices are 0-1 mA, 0-5 mA, 0-10 mA, 0-20 mA, 4-20 mA, 0-1 V, 0-5 V, 1-5 V, and 0-10 V. Press **EXE.**

3   Select the Burnout, either *Upscale* or *Downscale.* Press **EXE.**

4   Press **SPACE.**

5   Press **ON** to return to the Main Menu.

Digital Output (SC-7403)

```
                Output                        +
Channel    1:      Digital
Failsafe:     No
Input  Fail   Resp:    Ho
Alarm  Delay:    0   sec
Trip  Type:    50   0 % S
Trip  Level:      High
```

Digital Output Screen

1   Press **MODE.**

2   Select *Yes* or *No*, for Failsafe Operation. Press **EXE.**

3   Select *Alarm* or *Hold*, for the Response to Input Failure.
Press **EXE.**

4   Enter the Trip Delay in seconds. Press **EXE.**

5   Select *High* or *Low,* for the Trip Setting. Press **EXE.**

6   Enter Trip Level in percent of span. Press **EXE.**

7   Enter the Deadband in percent of span. Press **EXE.**

8   Press **SPACE.**

9   Press **ON** to return to the Main Menu.

```
|   |   |   |   | O | u | t | p | u | t |   |   |   |   |   |   |   | + |
| C | h | a | n | n | e | l |   | 1 | : |   | D | i | g | i | t | a | l |
| F | a | i | l | s | a | f | e | : |   | N | o |   |   |   |   |   |   |
| I | n | p | u | t |   | F | a | i | l |   | R | e | s | p | : |   | H | o |
| A | l | a | r | m |   | D | e | l | a | y | : |   | 0 |   | s | e | c |
| T | r | i | p |   | T | y | p | e | : |   | H | i | g | h |   |   |   |
| T | r | i | p |   | L | e | v | e | l | : |   | 5 | 0 | % | S | p |   |
```

Digital Output Screen

1   Press **MODE.**

2   Select *Same, Yes* or *No*, for Failsafe Operation. Press **EXE.**

3   Select *Same, Alarm* or *Hold*, for the Response to Input Failure. Press **EXE.**

4   Enter the Trip Delay in seconds. Press **EXE.**

5   Select the Trip Setting, *Same, High* or *Low.* Press **EXE.**

6   Enter the Trip Level in percent of span. Press **EXE.**

7   Enter the Deadband in percent of span. Press **EXE.** Output Channel 1 is configured.

8   To configure Output Channel 2, press **SPACE.**

9   Select, *Same, Yes* or *No*, for Failsafe Operation. Press **EXE.**

10   Select, *Same, Alarm* or *Hold*, for the Response to Input Failure. Press **EXE.**

11   Enter the Trip Delay in seconds. Press **EXE.**

12   Select the Trip Setting, *Same, High* or *Low.* Press **EXE.**

13   Enter the Trip Level in percent of span. Press **EXE.**

14   Enter the Deadband in percent of span. Press **EXE.**

15   Press **SPACE.**

16   Press **ON** to return to the Main Menu.

```
                Output                        +
Channel    1:      Analog
Range:     0 - 1 V
Burnout:       Upscale
Channel    2:      Digital
Failsafe:      No
Input   Fail   Resp:       Ho
Alarm   Delay:     0   sec
Trip    Type:      5 0   0 %S
Trip    Level:     Hi  gh
```

Analog & Digital Output Screen

1   Press **MODE.**

2   Select the analog output range. Range choices are Same, 0-1 mA, 0-5 mA, 0-10 mA, 0-20 mA, 4-20 mA, 0-1 V, 0-5 V, 1-5 V, and 0-10 V. Press **EXE.**

3   Select the Burnout, either *Same, Upscale* or *Downscale.* Press **EXE.** Output Channel 1 is configured

4   To configure Output Channel 2, press **SPACE.**

5   Select Failsafe Operation. *Same, Yes* or *No.* Press **EXE.**

6   Select the Response to Input Failure, *Alarm* or *Hold.* Press **EXE.**

7   Enter the Trip Delay in seconds. Press **EXE.**

8   Select Trip Setting, *High* or *Low.* Press **EXE.**

9   Enter Trip Level in percent of span. Press **EXE.**

10   Enter the Deadband in percent of span. Press **EXE.** Output Channel 2 is configured.

11   Press **SPACE.**

12   Press **ON** to return to the Main Menu.

Tools

The Tools menu provides access to the following functions: Time, World Files, and COMMS Link.

```
                     T o o l s
T i  m e       W o r l d     F i l e s
C o m m s
```
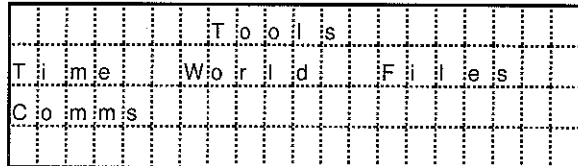
Tools Screen

Time

Time and Date

1   Select *Time* from the Tools menu.

2   Press **MODE** to get the menu:

    Stopwatch Timer Set →

3   Select SET and press **EXE.** Change the time and date using the arrow keys.

4   Press **EXE.**

5   Select **ON/Clear** to return to the Tools Menu.

Note: When you change the battery, you need to reset the time and date.

Stopwatch

1   Select *Time* from the Tools menu.

2   Press **MODE** to get the menu:

    Stopwatch Timer Set →

3   Select **Stopwatch** from the Time menu:

        STOPWATCH
        00:00:00.00

It records in increments of 0.05 seconds. To start the stopwatch, press **EXE**. Then use the following keys:

- **SPACE** whenever you want to record a laptime.

- **DEL** to freeze the display, the flashing dot shows the stopwatch is still counting. Press **DEL** to reset it.

- **EXE** to stop it then **DEL** to reset it

Return to the ordinary clock again with **ON/Clear.**

Timer

1   Select *Timer* on the Time menu:

```
            TIMER
Mins:_00        Secs:00

```
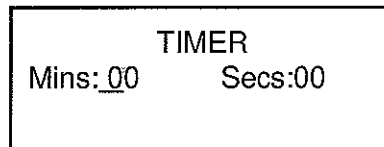
2   The cursor is on the minutes, ready for you to set the time you want to count down from.

- Use → to move between the minutes and seconds and ↑ and ↓ to change the settings.

- Press **EXE** to start the count down. (*ON/Clear* cancels).

When it gets to zero, the alarm sounds for one minute.

- Press **ON/Clear** to switch it off.

World allows you to set your home location. You can then find out the dialing code from there to any major city in the world. It also provides the time in these cities. The home location is the one displayed on the clock when you select time from the Tools menu. Whenever you reset the home location, the time changes on the clock to reflect the different time zone.

To reset the location:

1   Select *World* from the Tools menu. The first time, you are shown a screen showing you how to dial New York from the current home location. On this screen you can use ↓ and ↑ to browse through the list of cities and countries.

```
New York Manhattan
        USA
Sun 1 Jan   9:00a
Dial: 010 1 212
```

2   To set your location:

   •   Press **MODE** to get the SET FIND menu:

   •   Press **EXE** to Set and this prompt appears at the bottom of the screen:

        Set Home: _

   •   Start typing in the name of your nearest major city. As soon as you start typing, a city or country is displayed. If it is not the correct city, use ↓ to scroll through the list of alternatives and ↑ to come back up again, or type a few more letters of the name..

3   When the city you want is displayed, press **EXE.**

4   Press **ON/Clear** to return to the Main Menu.

Finding out codes and times

You can now use FIND to look up the dialing code from your location to any major city in the world. You are also told the current time in that city.

●　　　There is no need to get the menu, just start typing the first few letters of the city you are phoning:

The Find prompt appears, and a matching city and country are displayed.

●　　　Press **EXE** if the city is the one you want. If it is not, use the ↓ to scroll through the list of cities and press **EXE** on the right one, or type a few more letters.

If you want to see all 650 cities and countries, you can type A then use ↓ to scroll down.

Files

This function can be used to find and manipulate files created by Upload. A data file is a collection of records. When you save a file using the Upload option from the main menu, the record goes into a data file called MAIN. This is also where the Find option looks for records.

●　　　Select *Files* from the Tools menu.

													g	.	3	0	a
F	i	n	d				S	a	v	e				N	e	w	
O	p	e	n				P	r	i	n	t			S	o	r	t
D	i	r					C	o	p	y				D	e	l	e	t	e

File Options

Find Finds a record with a search clue - looking in the current data file.

Save Saves a record in the current file. After each save you return to the Save prompt - useful for saving a lot of records a once.

Use **EXE** to save a file. After you have saved a record you are given the chance to save another record, instead of just returning to the menu. This is useful when you want to save a lot of records.

New Creates a new data file and automatically makes this new file the current one.

Press **MODE** to select the device you want the new data file to be on.

Type in the name you want for it.

File names can be up to eight characters long. The first character must be a letter.

Open Opens a data file, making that file the current file which is then used by Find and Save.

You are prompted for the file name to open:

Open A: _

Press **MODE** if you need to select another pack, then type the name of the data file you want to make current.

To see a list of files press ↓ and choose the file you want by pressing **EXE**.

Print Prints the whole current data file, or selected records from it.

Select Print and press **EXE** to print all the records, or enter a search clue to print only the matching records.

You can press **ON/CLEAR** at any time to stop printing.

If there is no printer attached, you will get a DEVICE MISSING message.

Sort   Sorts the records in the data file into alphabetical
                  order.

                  Press **EXE** to sort the records.

                  ## WARNING! DO NOT SORT TRANSMITTER DATA RECORDS!

                  Sorting requires a lot of memory. You need
                  approximately twice the amount of space as the size
                  to the data file being sorted. If there isn't enough
                  space, the error message OUT OF MEMORY is
                  displayed.

Dir   Displays a directory of all the data files on the device
                  you select.

                  When you select DIR the following screen appears.

```
Dir of Files
Dir A:_
```

                  Press **EXE** or ↓ to see the list of files, then ↓ and ↑ to
                  browse through them.

Copy   Copies one or more data files.

When you select Copy the following screen appears:

```
Copy Files
From A: _
```

Press **MODE** if the file is to be copied on a Datapak.

To copy just one file that you know the name of, type the name and press **EXE.**

To see a list of files to choose from, press **EXE,** move down through the list with ↓ and press **EXE** on the file you want.   To copy all the files in the list, select <*>.

You will then see this prompt:

To B: _

Press **MODE** if you are copying to a different pack from the one suggested.

If you are copying only one file, and you want the copy to have a different name, type it. If you want the copy to have the same name, don't type anything.

Press **EXE.**

Delete   Deletes one or more data files.

When you select Delete you will be prompted:

Delete A: _

Press **MODE** if the file is on a pack.

To see a list of files to choose from, press **EXE,** move down through the list with ↓ and press **EXE** on the file you want. To delete all the files in the list, select <*>.

COMMS Link

This feature is used with the optional Psion COMMS Link Software, which allows communication between the HHC and a PC. The COMMS Link menu determines whether to send or receive information to the PC.
Upon selecting *Send* or *Receive* you will be given a list of files to select from.

Select the file name and press **EXE.** A message will be displayed acknowledging the action.

If you choose an existing filename (at the destination); the HHC/74 will display a warning message. You can then select to abort or overwrite the file.

Upload

Upload saves the transmitter parameters to a file on the A: drive of the communicator. When creating a file the communicator uses the Tag Name as the filename. A tag name consists of up to 8 characters. All characters are valid for a tag name, however, filenames must start with a letter and use only letters and numbers, not symbols. Any illegal characters in the tag name will be converted to a "Z". Therefore, you may want your tag names to start with a letter and avoid illegal characters.

Example: Tag Name: 101:temp
                File Name: z01ztemp

The uploaded file can now be modified and downloaded to the transmitter(s). Files are saved to Drive A.

Note: Drive A is volatile memory. Changing the batteries could result in loss of data. To save data, transfer the file(s) to an optional rampak or datapak on Drive C, or use the Psion COMMS Link to a PC.

Download

Download transfers a file from the communicator to a transmitter. Select *Download* and follow the prompts. This procedure will overwrite the existing transmitter memory.

Password

Each person using the communicator can have a unique password. The HHC/74 Main Menu will differ slightly with each level of access.

```
            |P|a|s|s|w|o|r|d|
|A|d|d|             |R|e|m|o|v|e|
|C|h|a|n|g|e|        |S|h|o|w|
|E|n|a|b|l|e|
```

Password Screen

The password levels are: Password, Configure, and Monitor.

- Password allows the user to perform all functions.

- Configure allows the user to perform all functions with the exception of passwords.

- Monitor allows the user to view all functions only.

Once you have entered a password level password, you can choose to set password protection ON or OFF. If password protection is on, the password will be requested every time the machine is turned on. The Password protection feature is turned on and off with the Enable function.

To Add a Password:

1   Select *Password* from the HHC/74 Main Menu. The Password menu will be displayed.

2   Select *ADD* from the menu. Passwords can be up to 19 characters long. Press **EXE.**

3   Re-enter the password and press **EXE.**

4   Select the Access Level: Password, Configure or Monitor. Follow the prompts.

Note: The first password entered will automatically have an access level of password.

To Remove a Password:

1   To remove a password, select *Password* from the HHC/74 main menu.

2   Select *Remove* from the password menu.

3   You are prompted to enter the password. Upon pressing **EXE** you will be prompted to re-enter the password.

To Change the Access Level of a Password:

1   To change the access level of the password, select *Password* from the HHC/74 main menu.

2   Select *Change* from the password menu. Enter the existing password. You will be prompted to re-enter the password again.

3   Choose the access level desired: Password, Configure, or Monitor and follow the prompts.

To Show the Access Level of a Password:

1   To show the access level of a password, select *Password* from the HHC/74 main menu.

2   Select *Show* from the password menu. Enter the existing password. You will be prompted to re-enter the password again. The access level will be displayed.

To Enable the Password function:

1   To enable a user to enter a password, select *Password* from the HHC/74 main menu.

2   Select *Enable* from the password menu. Follow the prompts.

To Disable the Password function:

1   To disable the access level of all passwords, select *Password* from the HHC/74 main menu.

2   Select *Disable* from the password menu. Follow the prompts.

CAUTION: If the unit shuts off after 5 minutes pressing ON will return you to the place where you left off. This also allows someone else access to your communicator. For security reasons be sure to turn your communicator OFF.

Examples

Example 1: Change the input type, range, and the output range for an existing SC-7401. The SC-7401 (single analog output) is presently configured for a type K thermocouple input with a range of 0 to 200 °C, linear to temperature, and an output of 0 to 10 mA, upscale burnout. Change the input to a type J thermocouple with a range of 0 to 500 °C, linear to temperature, and the output to 4 to 20 mA, upscale burnout.

Step 1: Connect the HHC/74 to the unit.

Step 2: Press **ON** (to turn on the HHC/74).

Step 3: When the main menu appears select **Newtx** (to load unit configuration data into the HHC/74).

Step 4: When the **TAG NAME** screen appears press **SPACE** to continue.

Step 5: When the main menu appears select **Sensor** (to change the sensor type).

Step 6: When the SENSOR screen appears press **MODE** (to enter the edit state).

Step 7: When the Choose sensor type menu appears select **T/C** (to choose thermocouple).

Step 8: When the Choose T/C type menu appears select **J** (to choose J type T/C).

Step 9: When the Choose Linearization Type menu appears select **Temp** (to choose linear to temperature).

Step 10: When the SENSOR screen appears press **ON** (to return to the main menu).

Step 11: A message will be displayed stating that the sensor type has been changed, proceed to Range. Press **SPACE** (to continue).

Step 12: When the main menu appears select **Range**.

Step 13: When the RANGE screen appears press **MODE** (to enter the edit state).

Step 14: When the PV/Range Units menu appears select **Celsius**.

Step 15: When prompted to enter the low range press **ON** (to clear the displayed value).

Step 16:   Enter 0. Press **EXE** (to enter the value).

Step 17:   When prompted to enter the high range press **ON** (to clear the displayed value).

Step 18:   Enter 500. Press **EXE** (to enter the value).

Step 19:   When the RANGE screen appears press **ON** (to return to the main menu).

Step 20:   When the main menu appears select **Output**.

Step 21:   When the OUTPUT screen appears press **MODE** (to enter the edit state).

Step 22:   When the Select Analog Output menu appears select **4 - 20 mA**.

Step 23:   When the Select Burnout menu appears select **Upscale**.

Step 24:   When the OUTPUT screen appears press **ON** (to return to the main menu).

Step 25:   When the main menu appears select **ON** to turn off the HHC/74.

Example 2:   Modify a configuration file offline for a SC-7405 and then download that file to a unit installed in the field. The file is saved under the Tag PWS001 (the units Tag number, this will have to be done to try this example). Change analog output burnout from upscale to downscale and the trip output level from 65% to 66.7%. Change the trip output delay from 0 to 2 seconds. Leave other parameters the same. The sensor type and range will not change.

Step 1:   Press **ON** (to turn on the HHC/74).

Step 2:   When the main menu appears select **Download** (to load the unit configuration data into the HHC/74).

Step 3:   When prompted to connect to a transmitter, press **N** (there is no transmitter connected yet).

Step 4:   When the **TAG TO DOWNLOAD** screen appears enter **PWS001**.

Step 5:   When the "File downloaded to communicator memory" message is displayed press **SPACE** (to continue).

Step 6:   When the main menu appears select **Output**.

Step 7: When the OUTPUT screen appears, press **MODE** (to enter the edit state).

Step 8: When prompted to connect to a transmitter, press **N** (there is no transmitter connected yet).

Step 9: When the Select Analog Output menu appears select **Same**. Press **EXE**.

Step 10: When the Select Burnout menu appears select **Downscale**.

Step 11: When the "Channel 1 configured Beginning Channel 2" message is displayed press **SPACE** (to continue).

Step 12: When the Failsafe Operation menu appears select **Same**. Press **EXE**.

Step 13: When the Response to Input Fail menu appears select **Same**. Press **EXE**.

Step 14: When the Enter Trip Delay screen appears select **ON** to clear the displayed value.

Step 15: Enter 2 for a 2 second delay. Press **EXE**.

Step 16: When the Select Trip Setting menu appears select **Same**. Press **EXE**.

Step 17: When the Enter Trip Level screen appears select **ON** to clear the displayed value.

Step 18: Enter 66.7 for a trip level of 66.7% of span. Press **EXE**.

Step 19: When the Enter Deadband screen appears press **EXE**.

Step 20: When the "Output Channel 2 configured" message is displayed press **SPACE** (to continue).

Step 21: When the OUTPUT screen appears press **ON** (to return to the main menu.

Step 22: When the main menu appears select **Upload** (to save the new configuration data into the HHC/74).

Step 23: When the "WARNING: FILE EXISTS" message is displayed select **Overwrite**.

Step 24: When the "Uploaded to: A:PWS001" message is displayed press **SPACE** to continue.

Step 25: When the main menu appears select **ON** to turn off the HHC/74.

Step 26: Take the HHC/74 to the unit in the field.

Step 27:   Connect the unit to the SC-7405 to be reconfigured with the SC-7411 cable provided.

Step 28:   Press **ON** key (to turn on the HHC/74).

Step 29:   When the main menu appears select **Download**.

Step 30:   When prompted to connect to a transmitter press **Y**.

Step 31:   When the **TAG NAME PWS001** screen appears press **SPACE** to continue.

Step 32:   When the TAG TO DOWNLOAD screen appears enter **PWS001**. Press **EXE** to send to the unit.

Step 33:   When the "File downloaded to transmitter" message is displayed press **SPACE** (to continue).

Step 34:   Press **ON** (to turn off the HHC/74).

Battery Replacement

The HHC/74 uses one 9 volt PP3 battery. Alkaline batteries are recommended to avoid data loss. If you are a heavy user, you can expect to replace the battery about every 3 months. The message "Battery too Low" will be displayed for 4 seconds and then the unit will switch itself off. You should replace the battery as soon as possible.

- *Do not* switch the unit ON again until you have replaced the battery.

- *Do not* remove the battery until you have a new one ready.

- Data on Datapaks and Rampaks are permanent and do not rely on the battery.

- Data on Device A depends on the battery and may be lost.
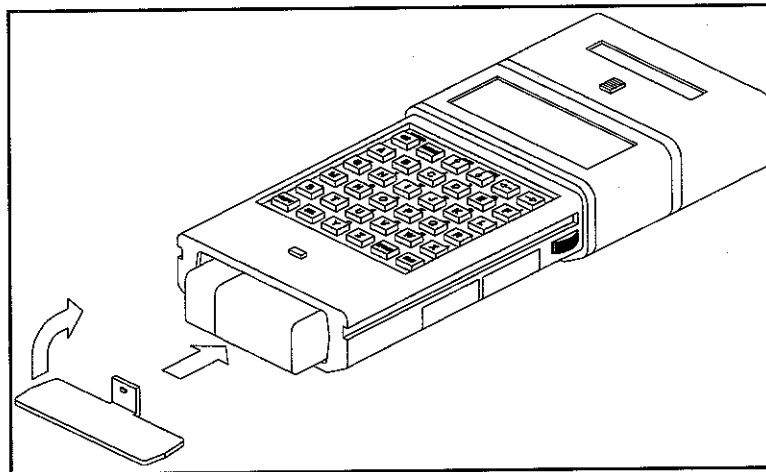
Figure 17 - Battery Compartment

The battery compartment is located at the base of the unit. Refer to Figure 17.

To replace the battery:

- Turn the unit OFF.

- Remove the battery cover by gripping the case firmly and pulling downward until the cover snaps off.

- Connect the new 9V battery and slide it into the battery compartment with the positive (+) contact going in first. Make sure that the contacts on the top of the battery slide all the way into the connector. Refer to Figure 17.

- Replace the battery cover by placing the lip into the corresponding groove. Clip the tab in place.

- Re-instate HHC/74 Software Program by selecting **MODE.** You will be prompted to insert menu item. Type in *HHC/74* and press **EXE.** This will install the HHC/74 menu item. Press **EXE** again to enter the HHC/74 program menu.

- Set the Time and Date (see page 2-31).

Troubleshooting

The following is a guide for solving basic problems with the hand held communicator.

Blank Screen

Adjust the contrast wheel on the right side of the case.

Missing Item on Main Menu

The item probably was deleted by mistake.

Out of Memory

This message indicates a lack of internal memory. Memory should be freed up by deleting unwanted records or procedures.

Battery Too Low

This message indicates that the battery is about to run out and after 4 seconds the HHC/74 will turn itself off. Replace the battery before turning on again.

Keypress Beeps

If while typing, the keystrokes are ignored and the unit starts beeping there are too many characters being entered. The limit is 64 characters in a diary entry and 254 characters with a maximum of 16 lines in a database record.

Stuck in an OPL Program

It is usually possible to break out of running a OPL program by pressing ON\CLEAR followed by a Q. However, if an OPL program has a loop in it which reads keys with a command such as GET< KEY or INPUT, it may be very hard to break out in this way. Try pressing ON/CLEAR followed by Q repeatedly in rapid succession.

Question mark ? on Screen

If a ? appears on the screen, an OPL program is using the INPUT command and inappropriate data has been entered. For example text, when numerals were required. Try again with the right kind of data.

Section 3 - PC Configurator

Overview

The family of **SC-7400** Universal 4-wire Transmitter/Alarms are configured using either the **SC-7400 PC Configurator** program or the **HHC-74** (Hand Held Communicator). The PC Configurator program communicates directly with the **SC-7400** transmitter to upload, download and configure the unit.

The **SC-7400 PC Configurator** can also be used to communicate with the **HHC/74** (Hand Held Communicator) via the Psion COMMS Link software and cable package. The Psion COMMS Link package is available as an optional purchase. Refer to the Psion documentation for installation and operation.

This section will provide you with all the information you need to start using the **SC-7400 PC Configurator**. You will learn how to:

- Install **SC-7400 PC Configurator** on your hard disk.
- Register your copy of **SC-7400 PC Configurator**.
- Get help with **SC-7400 PC Configurator**.
- Perform the Cable Hookup
- Use the **SC-7400 PC Configurator** software program.

System Requirements

Before you install the program, make sure you have all the hardware and software you need to run **SC-7400 PC Configurator**:

- IBM® compatible computer with a 386 (or higher) processor and a minimum of 4MB memory, running at 25 Mhz or higher
- VGA or EGA monitor
- 2 MB minimum of free disk space on the hard drive.
- 3½ (1.44M) floppy disk drive
- RS232 serial port with a 25 pin connector. A 9 to 25 pin adaptor can be used if you have a 9 pin RS232 serial port
- Microsoft DOS® 3.3 or higher
- Windows® 3.1 or higher
- SC-7410 Cable

Optional Accessories

- Microsoft® mouse or equivalent
- Psion COMMS Link Package

Installation

The installation of the **SC-7400 PC Configurator** software will not impact the operation of any previously installed **RiS** software or equipment. The **SC-7400 PC Configurator** software is Windows based software; if you are unfamiliar with using menus, dialog boxes, scroll bars, or the control-menu box, spend some time reading your *Windows* documentation.

To install **SC-7400 PC Configurator**:

1   Change the drive to the desired destination.

2   Make a directory called SC7400.

        Example: C:>md sc7400

3   Change the drive to the source directory.

        Example: Drive A:>   or   B:>

4   Start the install program by typing install and the destination location.

        Example: A:>install C:\sc7400

Once you finish copying the program to your hard drive, make a backup copy of the disks. Put the original disks away in a safe place. Avoid exposing them to sunlight, dust, and magnetic fields.

5   Start *Windows*.

6   Choose **New** from the **File** menu. The following screen will be displayed.

```
═|            New Program Object

 ┌New─────────────────────┐    ┌──────────┐
 │ ○ Program Group        │    │    OK    │
 │ ● Program Item         │    └──────────┘
 │                        │    ┌──────────┐
 └────────────────────────┘    │  Cancel  │
                               └──────────┘
                               ┌──────────┐
                               │   Help   │
                               └──────────┘
```
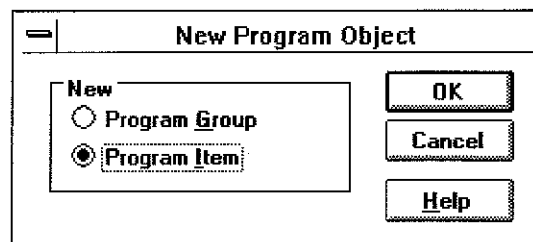
7   Select Program Item and press **OK**. The following screen will be displayed.

```
-|              Program Item Properties
 Description:        [                ]        [   OK   ]
 Command Line:       [                ]        [ Cancel ]
 Working Directory:  [                ]
 Shortcut Key:       [None            ]        [ Browse...  ]
                     [ ] Run Minimized         [ Change Icon... ]
                                               [  Help  ]
```
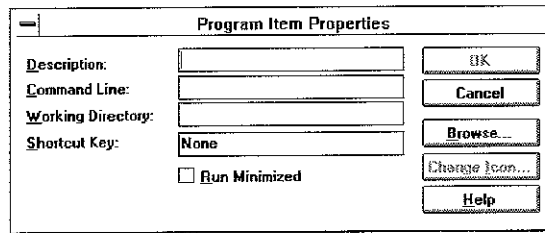
8   Enter the following information:

Description: SC-7400
Command Line: C:\windows\sc7400\sc7400.exe
Working Directory: C:\windows\sc7400

9   Select **OK.** Upon selecting OK, Windows will create an icon and place it in your application group.

10   Select the program icon to start the application. If you do not have a mouse, refer to Appendix A for keyboard operation.

SC-7400
Icon

Quitting SC-7400 PC Configurator

To quit **SC-7400 PC Configurator**,

1   Choose Exit from the File menu.

Registration

Before continuing, take a minute to fill out the Registration card and return it to **Rochester Instrument Systems, Inc**. Returning this card ensures that you will receive update notices and entitles you to toll-free customer support. The registration card is located on the last page of the manual.

Getting Help

Even the most experienced user needs help on occasion. To make things easier for you, we provide several ways for you to get the instruction and help you need.

- Read the **SC-7400 PC Configurator** Manual.
- Use the **On-Line** Help.
- Refer to the Windows Manual
- Refer to the DOS Manual

If you have exhausted all other help avenues and need help with your problem, contact **RiS Technical Support** at the numbers in the rear of this manual.

Support is available Monday through Friday, from 8:15 a.m. to 5 p.m, Eastern Time.

Cable Hookup

To communicate with the *SC-7400* transmitter you must:

● attach the *SC-7410 Cable* to the transmitter and the PC

● apply power to the transmitter

1 Connect the *SC-7410 Cable* to your computer and the *SC-7400* unit. Attach the 25-pin RS232 connector to your COM port connector. If you have a 9-pin connector you can use a 9 to 25-pin adaptor (not supplied). Insert the keyed probe into the front of the *SC-7400* unit.
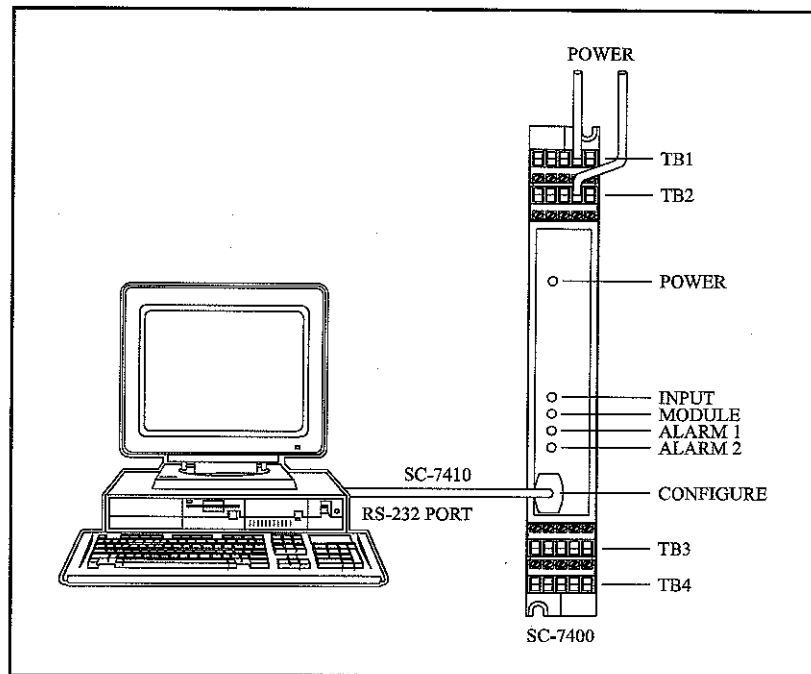
Figure 18 - PC to SC-7400

2 Supply power to the *SC-7400* unit.

Note: The power supply is jumper selectable. Make sure you apply the appropriate power to the unit. See Section 1 for wiring diagrams and jumper selections.

3 Type **win**, at the DOS prompt, to start Windows.

4 Select the *SC-7400* icon from the Windows programs group.

5 To communicate directly with the transmitter; select the proper COM port from the drop-down box and select **OK.** The current transmitter configuration values will be uploaded.

To build files offline select Stand Alone. Stand Alone allows you configure information for storage as a file. If you are using the Stand Alone method, the transmitter values are defaulted to:

Input = 0 to 85 mV
Output = 4 to 20 mA for analog outputs
Output = 50 % Hi trip, no delay, 1% deadband, non-failsafe for trip outputs
Power = 20-138 Vdc

```
┌──────────────────────────────────────────┐
│ ━│          Com Port Selection             │
├──────────────────────────────────────────┤
│                                            │
│  ┌─────────────┐    ┌──────────────┐       │
│  │ COM2      ▾ │    │     OK       │       │
│  └─────────────┘    └──────────────┘       │
│                                            │
│                     ┌──────────────┐       │
│                     │    Exit      │       │
│                     └──────────────┘       │
│                                            │
│                 ┌──────────────────┐       │
│                 │   StandAlone     │       │
│                 └──────────────────┘       │
│                                            │
│                     ┌──────────────┐       │
│                     │    Help      │       │
│                     └──────────────┘       │
│                                            │
└──────────────────────────────────────────┘
```
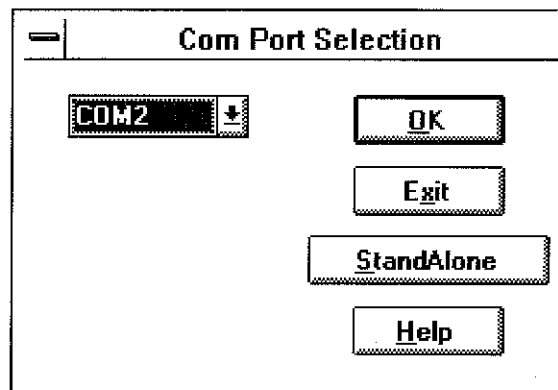
Configuring the Input Values

This section describes the process for selecting the desired input value.

1   Select **Inputs** from the **Configuration** menu. The following screen will be displayed.

```
┌─────────────────────────────────────────────────────────────┐
│ ━|              Input Configuration                          │
├─────────────────────────────────────────────────────────────┤
│ ┌─Input Type─────────────────────────────┐  ┌─────────────┐ │
│ │  ◉ Voltage          ○ Ohms             │  │   Setup     │ │
│ │                                        │  └─────────────┘ │
│ │  ○ Current          ○ RTD              │  ┌─────────────┐ │
│ │                                        │  │   Cancel    │ │
│ │  ○ Millivolt        ○ Slidewire        │  └─────────────┘ │
│ │                                        │  ┌─────────────┐ │
│ │  ○ Thermocouple                        │  │   Help      │ │
│ └────────────────────────────────────────┘  └─────────────┘ │
└─────────────────────────────────────────────────────────────┘
```

2   Select the Input Type, the choices are: **Voltage, Current, Millivolt, Thermocouple, Ohms, RTD,** and **Slidewire.**

Note: Voltage, Current, and Slidewire are not included for IS models. The software will determine if the unit is an IS (intrinsically safe) or Non-IS (non-intrinsically safe) model.

3   Select **Setup** and follow the directions below for each Input Type.

Voltage Input
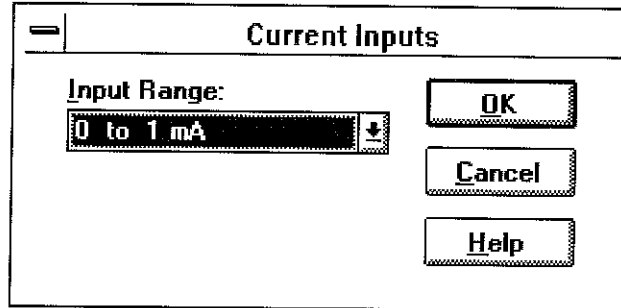
1   Upon selecting **Voltage**, the following screen will be displayed.

```
┌─────────────────────────────────────────────────┐
│ ━|              Voltage Inputs                   │
├─────────────────────────────────────────────────┤
│                              ┌─────────────┐     │
│                              │     OK      │     │
│  Input Range:                └─────────────┘     │
│  ┌───────────────┐┌──┐       ┌─────────────┐     │
│  │ 0  to  1V     ││ ±│       │   Cancel    │     │
│  └───────────────┘└──┘       └─────────────┘     │
│                              ┌─────────────┐     │
│                              │   Help      │     │
│                              └─────────────┘     │
│                                                  │
└─────────────────────────────────────────────────┘
```

2   Select the Input Range value from the drop-down box by highlighting your choice and selecting **OK.** Upon selecting OK, you will be returned to the main screen.

Current Input

1 Upon selecting **Current**, the following screen will be displayed.

```
┌─────────────────────────────────────────────┐
│ ▬ │           Current Inputs                 │
│                                              │
│  Input Range:              ┌──────────┐      │
│  ┌──────────────────────┐  │    OK    │      │
│  │ 0 to 1 mA          ▼ │  └──────────┘      │
│  └──────────────────────┘  ┌──────────┐      │
│                            │  Cancel  │      │
│                            └──────────┘      │
│                            ┌──────────┐      │
│                            │   Help   │      │
│                            └──────────┘      │
│                                              │
└─────────────────────────────────────────────┘
```
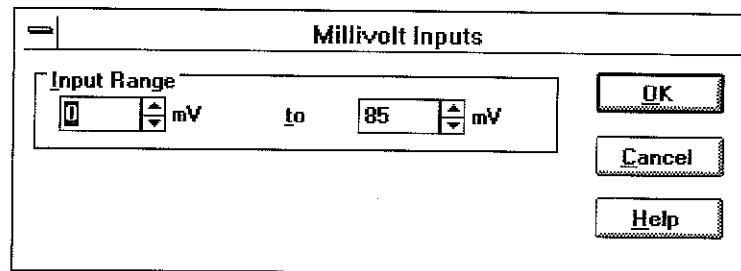
2 Select the input current value from the drop-down box by highlighting your choice and selecting **OK**. Upon selecting OK, you will be returned to the main screen.

Millivolt Input

1 Upon selecting **Millivolt**, the following screen will be displayed.

```
┌───────────────────────────────────────────────────────┐
│ ▬ │              Millivolt Inputs                      │
│                                                        │
│ ┌─Input Range──────────────────────┐  ┌──────────┐    │
│ │ ┌──┐        ┌──┐                  │  │    OK    │    │
│ │ │0 │▲▼ mV  to │85│▲▼ mV          │  └──────────┘    │
│ │ └──┘        └──┘                  │  ┌──────────┐    │
│ └──────────────────────────────────┘  │  Cancel  │    │
│                                        └──────────┘    │
│                                        ┌──────────┐    │
│                                        │   Help   │    │
│                                        └──────────┘    │
└───────────────────────────────────────────────────────┘
```

2 Set the Input Range and select **OK**. You may type in the value or use the incremental arrows to select the desired value. The default ranges shown are the minimum and maximum values. Upon selecting OK, you will be returned to the main screen.

1   Upon selecting **Thermocouple**, the following screen will be displayed.
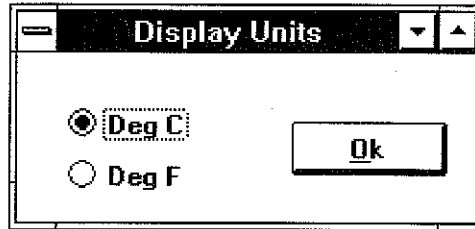
```
┌──────────────────────────────────────┐
│ ▬    Display Units          ▼  ▲      │
├──────────────────────────────────────┤
│                                      │
│   ⦿ Deg C                            │
│                      ┌──────────┐    │
│   ○ Deg F            │    Ok    │    │
│                      └──────────┘    │
└──────────────────────────────────────┘
```

Choose whether you want the display units to be degrees Centigrade or Fahrenheit, and click on OK to proceed to the next screen. This example will use Centigrade.

```
┌──────────────────────────────────────────────────────────┐
│ ▬            Thermocouple Inputs                          │
├──────────────────────────────────────────────────────────┤
│ ┌─Input Type──────────────────────────┐   ┌──────────┐   │
│ │ NIST:              DIN:              │   │    OK    │   │
│ │ ⦿ Type J           ○ Type J          │   └──────────┘   │
│ │ ○ Type K           ○ Type T          │   ┌──────────┐   │
│ │ ○ Type E           BS:               │   │  Cancel  │   │
│ │ ○ Type R           ○ Type N          │   └──────────┘   │
│ │ ○ Type S                             │   ┌──────────┐   │
│ │ ○ Type T                             │   │   Help   │   │
│ │ ○ Type B                             │   └──────────┘   │
│ └─────────────────────────────────────┘                  │
│ ☐ Linear Output                                          │
│ ┌─Input Range─────────────────────────────────┐          │
│ │ -180  ⬍ C      to    760   ⬍ C              │          │
│ └─────────────────────────────────────────────┘          │
└──────────────────────────────────────────────────────────┘
```

2   Select the desired Thermocouple Input Type. The input range selections will change dependant upon the thermocouple type. You may type in the input range or use the incremental arrows to select the desired value. The input ranges shown are the default minimum and maximum input values.

3   Select the Input Range.

4   If you desire Linear Output, check the linear output box. Linear output will provide you with an output proportional to temperature.

5   Select **OK.** Upon selecting OK, you will be returned to the main screen.

Ohms Input

1   Upon selecting **Ohms**, the following screen will be displayed.

```
┌─────────────────────────────────────────────────────┐
│ ▬│                 Ohm Inputs                          │
│ ┌─Input Range──────────────────────┐  ┌──────────┐   │
│ │ ▌   ⬍ Ohms    to    500  ⬍ Ohms │  │    OK    │   │
│ │                                  │  └──────────┘   │
│ ┌─Wires────────────────────────┐   ┌──────────┐      │
│ │ ◉ 3 Wires                    │   │  Cancel  │      │
│ │ ○ 4 Wires                    │   └──────────┘      │
│ │                              │   ┌──────────┐      │
│ └──────────────────────────────┘   │   Help   │      │
│                                     └──────────┘      │
└─────────────────────────────────────────────────────┘
```
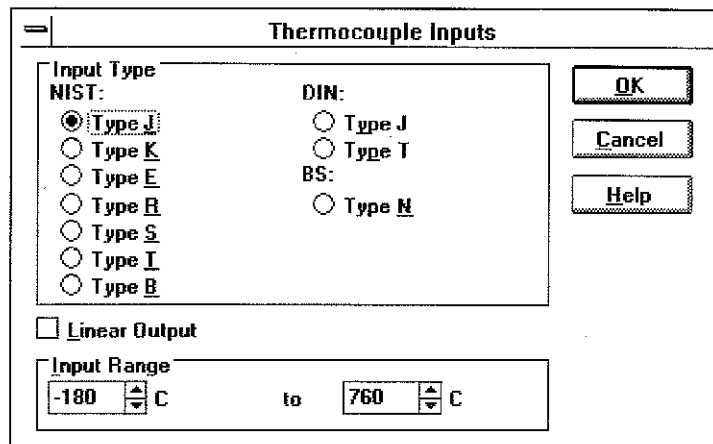
2   Set the Input Range. You may type in the input value or use the incremental arrows to select the desired value. The input range values shown are the default minimum and maximum values.

3   Select 3 or 4 wires.

4   Select **OK**. Upon selecting OK you will be returned to the main screen.

1   Upon selecting **RTD**, the following screen will be displayed.
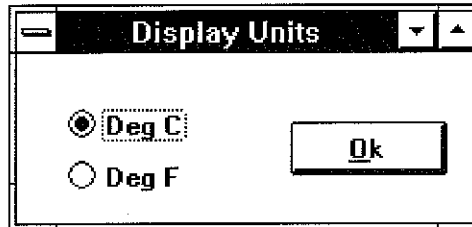
```
┌──────────────────────────────────────┐
│ ━  │     Display Units      │ ▼ │ ▲ │
├──────────────────────────────────────┤
│                                      │
│   ◉ Deg C              ┌──────────┐  │
│                        │    Ok    │  │
│   ○ Deg F              └──────────┘  │
│                                      │
└──────────────────────────────────────┘
```

Choose whether you want the display units to be degrees
Centigrade or Fahrenheit, and click on OK to proceed to the next
screen. This example will use Centigrade.

```
┌──────────────────────────────────────────────┐
│ ━ │            RTD Configuration             │
├──────────────────────────────────────────────┤
│ ┌─Wire Type──────────────┐    ┌──────────┐   │
│ │ ◉ Platinum - .3850     │    │    OK    │   │
│ │ ○ Platinum - .3916     │    └──────────┘   │
│ │ ○ Platinum - .3923     │    ┌──────────┐   │
│ │ ○ Nickel               │    │  Cancel  │   │
│ │ ○ Copper               │    └──────────┘   │
│ └────────────────────────┘    ┌──────────┐   │
│ ┌─Wire Configuration─────┐    │   Help   │   │
│ │ ○ 2 Wire               │    └──────────┘   │
│ │ ◉ 3 Wire               │                   │
│ │ ○ 4 Wire               │                   │
│ │ ○ 3 Wire Differential  │                   │
│ └────────────────────────┘                   │
│ ┌─Input Range──────────────────────────────┐ │
│ │ -200  ⬍ C      to      850   ⬍ C         │ │
│ └──────────────────────────────────────────┘ │
└──────────────────────────────────────────────┘
```

2   Select the Wire Type.

3   Select the Wire Configuration.

4   Set the Input Range. You may type in the input range value or use
the incremental arrows to select the desired value. The input
range values shown are the default minimum and maximum
values.

5   Select **OK**. Upon selecting OK, you will be returned to the main
screen.

Slidewire Input

1   Upon selecting **Slidewire**, the following screen will be displayed.

```
┌─┬─────────────────────────────────────────────────┐
│ ▭│              Slidewire Inputs                    │
├──┴────────────────────────────────────┐  ┌───────┐│
│ ┌─Input Range───────────────────────┐ │  │   OK  ││
│ │ ┌──┐                    ┌────┐ ▲   │ │  └───────┘│
│ │ │0 │  Ohms      to      │1000│ ▼ Ohms│          │
│ │ └──┘                    └────┘     │ │  ┌───────┐│
│ └───────────────────────────────────┘ │  │ Cancel││
│                                        │  └───────┘│
│                                        │  ┌───────┐│
│                                        │  │  Help ││
│                                        │  └───────┘│
└────────────────────────────────────────┴──────────┘
```
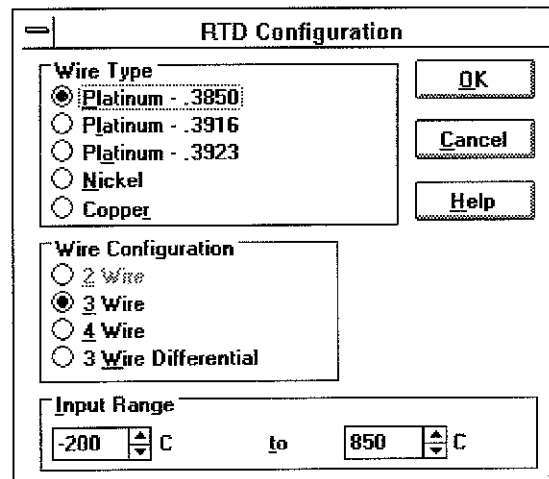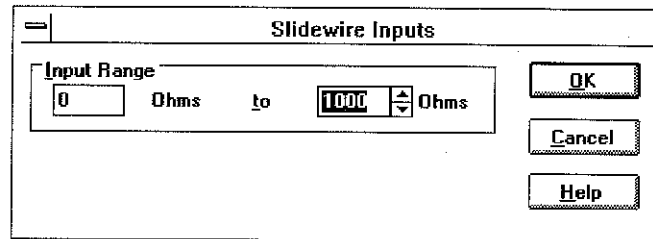
2   Set the Input Range. You may type in the input range or use the incremental arrows to select the desired value. The range values shown are the default minimum and maximum values.

3   Select **OK**. Upon selecting OK, you will be returned to the main screen.

Configuring the Output Values

The output screens are dependent upon the **SC-7400** model number. There are two screens; the Analog Output screen and the Relay Output screen. You may see one or both of these screens dependent upon the model number.

The following is a list of the available **SC-7400** models. The N after the model number denotes non-intrinsically safe and the I indicates intrinsically safe.

SC-7401-N	Single analog output
SC-7401-I	Single analog output, intrinsically safe input
SC-7402-N	Dual analog output
SC-7402-I	Dual analog output, intrinsically safe input
SC-7402-N	Dual analog output, 0-100 mV fixed input
SC-7403-N	Single trip/alarm output
SC-7403-I	Single trip/alarm output, intrinsically safe input
SC-7404-N	Dual trip/alarm output
SC-7404-I	Dual trip/alarm output, intrinsically safe input
SC-7405-N	Single analog and single trip/alarm
SC-7405-I	Single analog and single trip/alarm, intrinsically safe input

Analog Output Screen

The analog output screen is displayed for the *SC-7401, SC-7402,* and *SC-7405.* Both outputs for the *SC-7402* dual analog output unit are the same, therefore the analog output screen applies for both outputs. The *SC-7405* has both an analog and a relay output screen; therefore once you configure the analog output the relay output screen will be displayed.

```
═|                    Analog Output Configuration

 Analog Output Range:
  4  to 20 mA           ┌ Input Failure ┐          ┌──────────┐
  0  to  1 mA           │  ◉ Upscale    │          │    OK    │
  0  to  5 mA           │               │          └──────────┘
  0  to 10 mA           │  ○ Downscale  │          ┌──────────┐
  0  to 20 mA           └───────────────┘          │  Cancel  │
  0  to  1V                                        └──────────┘
  0  to  5V                                        ┌──────────┐
  0  to 10V                                        │   Help   │
  1  to  5V                                        └──────────┘
```
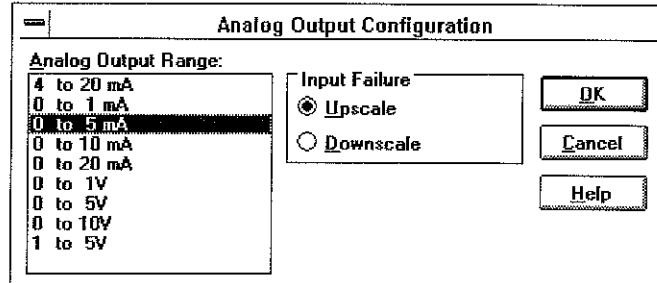
1   Chose **Outputs** from the **Configuration** menu.

2   Select the **Analog Output Range** from the list box.

3   Select the Input Failure, either **Upscale** or **Downscale.**

4   Select **OK.** Upon selecting OK, you will be returned to the main screen.

Relay Output Screen

The Relay Output Screen is displayed for the *SC-7403, SC-7404* and the *SC-7405.* The *SC-7404* screen is slightly different in that it prompts you to select outputs for both channels.

```
┌─┬────────────────────────────────────────────────────┐
│ ═│              Relay Output Configuration            │
│  └──┌─ Channel Selection ──────────────┐──────────────│
│     │  ◉ One                           │              │
│     │  ○ Two                           │              │
│     └──────────────────────────────────┘              │
│  Deadband:         ┌─ Trip setting ──────┐            │
│  │E  │⬆⬇│ % of Span │  ◉ High           │  ┌──OK───┐  │
│                     │  ○ Low            │  └───────┘  │
│  Trip Delay:        └───────────────────┘  ┌─Cancel─┐ │
│  │0  │⬆⬇│ Seconds                          └───────┘  │
│                     ☒ Failsafe             ┌──Help──┐ │
│  Trip Level         ☐ Input Failure Response└───────┘ │
│  │2  │⬆⬇│ % FS                                        │
└───────────────────────────────────────────────────────┘
```

1   Choose **Outputs** from the **Configuration** menu. You may type in the desired values or use the incremental arrows to select the value.

2   Set the **Deadband** value. The deadband value is the range of values for which the applied control quantity (voltage or current) has no effect on the response of the circuit; therefore the deadband is the percent of span before the alarm will reset.

3   Select the **Trip Delay.** The trip delay determines how long the output has to remain at the trip level before activating the alarm.

4   Set the **Trip Level.** The level at which the alarm will activate.

5   Select the Trip Setting, **High** or **Low.**

6   Select Failsafe if desired. Relay will turn off on alarm.

7   Select Input Failure Response if desired. Input Failure Response causes the alarm to activate when the sensor fails or is out of range.

8   Select **OK.** Upon selecting OK, you will be returned to the main screen.
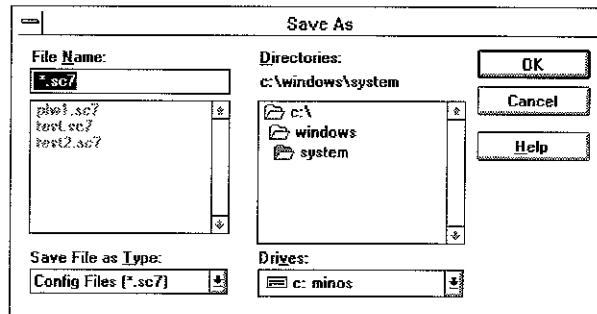
Saving Files

When you create a configuration, it is not permanently stored until you save it as a file. A new file can be created by modifying an existing file, or by creating a new file.

To create a new file;

1   Select **New** from the **File** menu. The new file will contain the default values.

2   Modify the configuration.

To save a new file;

1   Choose **Save** from the **File** menu. The following screen will be displayed.

2   Specify the drive and directory where you want the file stored.

3   Type a *filename* in the File Name text box.

4   Select **OK** to save the file and return to the configuration program.

To modify an existing file;

1   Access the existing file by selecting **Open** from the **File** menu.

2   Select the appropriate file.

3   Select **OK**.

4   Modify the configuration.

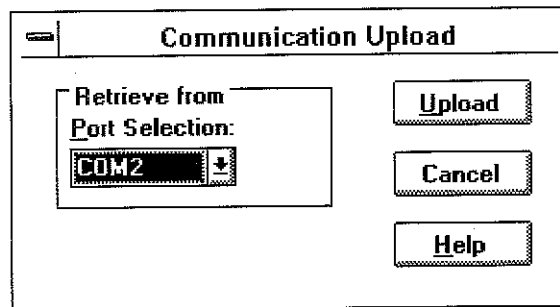**5**   Select **Save** from the **File** menu to save the modified file under the same name

OR

Select **Save As** from the **File** menu to save the modified file under a different filename.

Upload Configuration

Upload allows you to upload the current configuration into the **SC-7400 PC Configuration** program. You can then manipulate the information as necessary.

1 Chose **Communications Upload** from the **Communications** menu. The following screen will be displayed.

```
┌──────────────────────────────────────────────┐
│ ▭ │        Communication Upload              │
├──────────────────────────────────────────────┤
│  ┌─ Retrieve from ──────┐    ┌──────────┐     │
│   Port Selection:            │  Upload  │     │
│  ┌──────────────┐            └──────────┘     │
│  │ COM2       ▼ │                             │
│  └──────────────┘            ┌──────────┐     │
│  └──────────────────────┘    │  Cancel  │     │
│                              └──────────┘     │
│                                               │
│                              ┌──────────┐     │
│                              │  Help    │     │
│                              └──────────┘     │
└──────────────────────────────────────────────┘
```
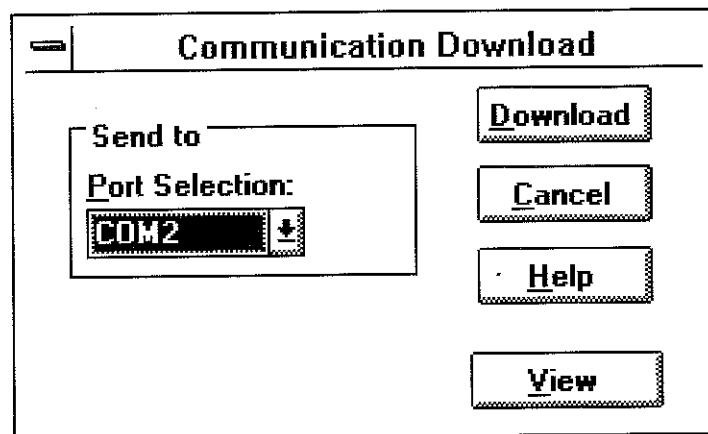
2 Chose the **Port** to retrieve the information.

3 Select **Upload.** The computer will upload the current configuration.

Note: Be sure to close all open files or save the current configuration as a file as the Upload function will replace all values with the transmitter values.

Download Configuration

Download sends the configuration information to the SC-**7400** unit.

1. Chose **Communication Download** from the **Communications** menu. If you have invoked a password, you will be prompted for it at this time. Enter the password and select **O**K. If you have not assigned a password you will not be prompted. The following screen will be displayed.
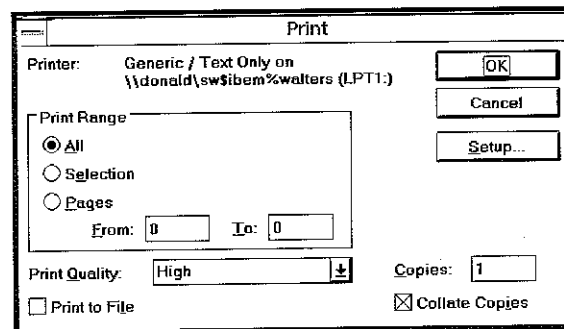
```
┌──────────────────────────────────────────────┐
│ ▭│     Communication Download              │
│                                              │
│   ┌Send to──────────────┐   ┌─────────────┐  │
│   │                     │   │ Download    │  │
│   │ Port Selection:     │   └─────────────┘  │
│   │ ┌─────────────┬──┐  │   ┌─────────────┐  │
│   │ │ COM2        │ ↓│  │   │  Cancel     │  │
│   │ └─────────────┴──┘  │   └─────────────┘  │
│   └─────────────────────┘                    │
│                             ┌─────────────┐  │
│                             │ ·  Help     │  │
│                             └─────────────┘  │
│                                              │
│                             ┌─────────────┐  │
│                             │   View      │  │
│                             └─────────────┘  │
└──────────────────────────────────────────────┘
```

2. Select the appropriate COM port from the drop-down box.

3. Select **View** to preview your configuration selections. This feature allows you to look at the selected settings before downloading them to the unit. There are two screens, one showing the input configuration and the other showing the output configuration. You can not make changes from these screens. To make changes, select **Cancel** and reconfigure the inputs and/or outputs as desired.

4. Select **Download.** The input and output configurations will now be sent to the unit.

Print

The Print function allow you to print out the configuration file. Choosing **View** from the **File** menu allows you to preview the current configuration. The input selections are displayed first; the output configuration is second.

1   Choose **Print** from the **File** Menu. The following screen will be displayed.

```
┌──────────────────────────────────────────────────────────┐
│ ═══             Print                                      │
├──────────────────────────────────────────────────────────┤
│  Printer:     Generic / Text Only on          ┌────────┐  │
│               \\donald\sw$ibem%walters (LPT1:) │  [OK]  │  │
│                                                └────────┘  │
│  ┌─Print Range──────────────────────────┐     ┌────────┐  │
│  │ ◉ All                                 │     │ Cancel │  │
│  │ ○ Selection                           │     └────────┘  │
│  │ ○ Pages                               │     ┌────────┐  │
│  │        From: [0]    To: [0]           │     │ Setup..│  │
│  └───────────────────────────────────────┘     └────────┘  │
│                                                            │
│  Print Quality:   [High          ] [↓]   Copies: [1     ] │
│  □ Print to File                      ⊠ Collate Copies    │
└──────────────────────────────────────────────────────────┘
```

**2**   Select the desired print options and select **OK.**

Password

Passwords provide protection to functions that can permanently change the system configuration or have the potential for destroying information at the remote equipment. Once the password function is enabled, it will prevent any user without the correct password from executing the requested function.

Note: If you do not assign a password to any functions, then all users will have access to all functions. Different functions can be assigned different passwords.
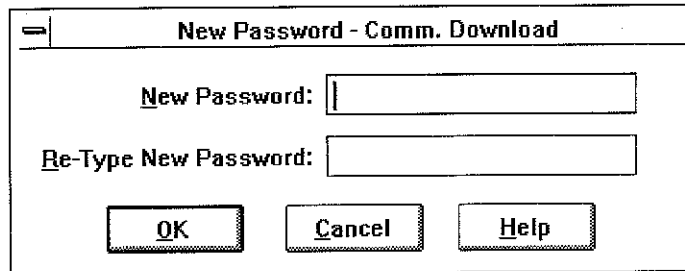
Enabling a Password

To use the Passwords feature

1   Choose **Password** from the **File** menu. The following screen will be displayed.
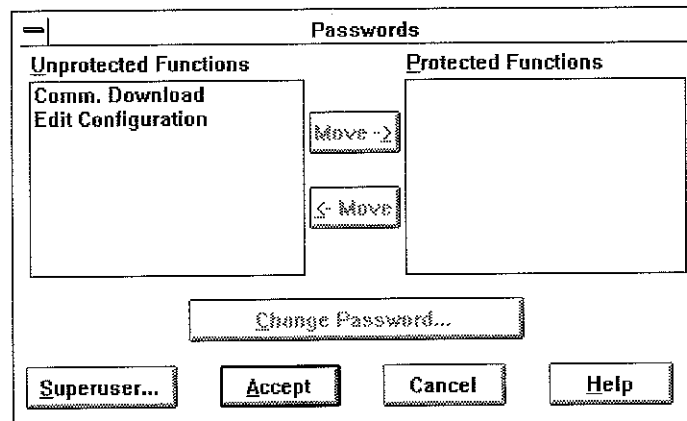
Unprotected functions can be moved to the protected functions box by highlighting one or both and selecting Move.

2   Upon selecting Move, the New Password screen will be
displayed.

```
┌──────────────────────────────────────────────────┐
│ ═│         New Password - Comm. Download           │
│                                                    │
│        New Password: │|                    │        │
│                                                    │
│   Re-Type New Password: │                    │      │
│                                                    │
│        ┌─────────┐  ┌─────────┐  ┌─────────┐      │
│        │   OK    │  │ Cancel  │  │  Help   │      │
│        └─────────┘  └─────────┘  └─────────┘      │
└──────────────────────────────────────────────────┘
```

3   Enter the **New Password** and **Re-type** it on the second line.

Passwords can be from 1 to 20 alpha-numeric characters in
length. Passwords are not case sensitive.

4   Select **OK.** You will be returned to the Passwords screen.

5   Select **Accept** to enable the new password.

Modify an Existing Password

1   Chose **Password** from the **File** menu.

2   Highlight the Protected Function that you wish to change.

3   Select **Change Password**.

4   Enter the existing password and select **OK.**

5   Enter the new password twice and select **OK.**

6   Select **Accept** to enable the new password.

Note: When selecting multiple functions their passwords must be the
same.

Note: The user may select multiple functions.

Disabling a Password

1   Chose **Password** from the **File** menu.

2   Highlight the Protected Function that you wish to change to an Unprotected Function. Select ≤- **Move**. Upon selecting move you will be prompted for the current password. Enter the password.

3   Select **Accept.**

Superuser

The *Superuser* function allows global access to all functions. Superuser is an override feature. It can be used to enter all protected functions or to remove passwords from the system (for example, someone forgot their password).

The default Superuser password is RIS. If you decide to implement password protection, you should change the default password as soon as possible.

To change the Superuser password;

1   Select **Password** from the **File** menu.
2   Select **Superuser.**
3   Enter **RIS.**
4   Select **Change Password.**
5   Enter the new Superuser password twice and select **OK.**
6   Select **OK.**
7   Select **Accept.**

To remove a password;

1   Select **Password** from the **File** menu.
2   Select **Remove** protection.
3   Select **OK.**
4   Select **Accept.**

Appendix A

Keyboard Skills

Keyboard Skills

This Appendix is intended to be a basic guide for using Windows without a mouse. It does not cover all Windows keyboard functions. For more keyboard information consult your Windows documentation.

Application commands are listed on menus. Every application has its own menus, with a Control menu common to all applications. The Control menu, also called the System menu, opens from the small box in the upper-left corner of each window. Other menus are represented by names in the menu bar at the top of the application window.

Selecting an Icon

To select an icon:

1   Press **ALT W**.

2   Select the application group by using the arrow keys.

3   Select the program icon using the arrow keys and press Enter.

Selecting and Canceling Menus

To select a menu:

1   Press **ALT** (or **F10**) to select the menu bar.

2   Press the **left arrow** or **right arrow** to select the menu you want.

3   Press **Enter** to open the selected menu.

To cancel a menu:

1   Press **ALT** (or **F10**) to cancel the menu and move back to the application workspace.
     or
1   Press **ESC** to cancel the menu but remain on the menu bar so that you can select another menu.

Choosing Menu Commands

The items listed on menus are most often commands that represent actions you want the application to carry out. They can also be characteristics you assign to graphics or text, a list of open windows or files, or the names of cascading menus, which are menus that list more commands. No matter which items you wish to choose, you use the same procedure.

To select an item from a selected menu:

1   Type the underlined letter in the name of the item you want. You can use the up and down arrow keys to select the item you want; then press **Enter.**

Dialog Boxes

Dialog boxes request information from you and provide information to you. The current option is marked by a highlight or dotted rectangle (or both) around the name of the option or button.

To move within a dialog box:

1   Press **TAB** to move forward (generally left to right and top to bottom) or **Shift + Tab** to move in the opposite direction.
or

1   Hold down the **ALT** key and type the underlined letter in the option name or group name

2   Within a group or options, use the **Direction keys** to move from one option to another.

To choose a command button:

1   Press **TAB** to move to the command you want.

2   Press the **Spacebar** or **Enter** to choose the button and complete the command.

Scroll Bars

Scroll bars allow you to view information that requires more space than is available.

1 Press the **Direction** key that points in the direction you want to scroll. Other scrolling options are listed in the following table.

To Scroll	Press these keys
One window up or down	Page Up or Page Down
One window left or right	Ctrl + Page Up or Ctrl+ Page Down
To the beginning of a line	Home
To the end of a line	End
To the beginning of the document	Ctrl + Home
To the end of the document	Ctrl + End

List Boxes

A list box shows a column of available choices. If there are more choices than can fit in the list box, scroll bars are provided so that you can move up and down quickly through the list.

To select a single item from a list box:

1 Use the **Direction** keys to scroll to the item you want. Or type the first letter of the item you want. This will move you to the first item that starts with that letter.

2 Press **Enter** to choose the item and complete the selected command.

Drop-Down Boxes

A drop-down list box appears initially as a rectangular box with the default choice highlighted in the box. The arrow in a square box at the right opens into the list of available choices when you select it. If there are more choices than can fit into the drop-down list box, scroll bars are provided.

1 Press **Alt+Down Arrow** to open the drop-down list box.

2 Use the **Up** or **Down Arrow** key to reach the item you want, and press **Alt +Up Arrow** or **Alt +Down Arrow** to select the item.

Glossary

Glossary

A

alarm   A detected condition. Indicated by an LED on the front of the module.

C

CPU   Central Processing Unit. In a digital computer, the section containing the arithmetic and logic, control, and internal memory units.

D

deadband   The range of values for which an applied control quantity (e.g., current or voltage) has no effect on the response of a circuit.

E

extension   The period and up to three characters at the end of a filename. An extension usually identifies the kind of information a file contains.

F

failsafe   Failsafe Mode is when the condition of a relay in the unpowered (or shelf) state is equal to the alarm condition. This is also referred to as the de-energized state.

I

intrinsic safety   Intrinsic safety is an design technique applied to electrical equipment to prevent explosions in hazardous areas.

L

linear output   An output whose values can be represented by a straight line on a graph.

LED   Light emitting diode.

M

millivolt Abbreviation mV. A unit of low voltage; 1 mV = 10^{-3} V.

O

ohm The basic unit of resistance, reactance, or impedance.

OPL Organizer Programming Language.

R

range The limits within which a circuit or device operates.

RTD A transducer consisting of a specially made resistor whose resistance varies linearly with temperature.

S

slide wire A simple potentiometer consisting of a single, straight piece of resistance wire with a sliding contact.

T

thermocouple A device consisting essentially of an intimate bond between two wires or strips of dissimilar metals. When the bond is heated, a dc voltage appears across it.

trip A relay output.

trip level The value at which a trip/alarm is activated.

V

voltage Electromotive force, or difference of potential. E = IR where I is current and R is resistance.

PROCEDURES FOR FACTORY REPAIR AND RETURN

A.   Obtain a Returned Material Authorization (RMA) number by calling the AMETEK Repair Department and giving the following information:

1.   *Model* and *Serial Number* of the equipment.
2.   Failure Symptom - **Be Specific**
3.   Approximate date of installation.
4.   The site name and address of the failed equipment.
5.   Complete shipping information for the return of the equipment if other than the operating site.
6.   Name and telephone number of person to contact if questions arise.

B.   Enclose the information with the equipment and pack in a commercially accepted shipping container with sufficient packing material to insure that no shipping damage will occur. Mark the outside of the container with the RMA number.
Ship to the appropriate location:

Attention: Repair Department

AMETEK Power Instruments
255 North Union Street
Rochester, New York 14605 USA
Telephone: (888) 222-6282
Fax: (716) 238-4097

C.   Your equipment will be tested, repaired, and inspected at the factory. Normal factory turn-around is ten working days or less (excluding shipping time).

D.   For emergency service or repair status information, please contact the AMETEK Repair Department at (800) 881-4156.

WARRANTY — AMETEK warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service. AMETEK will replace any component found to be defective, upon its return, transportation charges prepaid, within one year of its original purchase. AMETEK will extend the same warranty protection on accessories which is extended to AMETEK by the original manufacturer. AMETEK assumes no responsibility, expressed or implied, beyond its obligation to replace any component involved. Such warranty is in lieu of all other warranties expressed or implied.

TELEPHONE / FAX NUMBER LIST

ROCHESTER
SCIENTIFIC COLUMBUS

This errata sheet provides an easy-to-use reference for all major departments. Use these numbers for ordering equipment, application assistance, technical support, and scheduling field service.

Please Note: Your instruction manual may contain other phone and fax numbers; this list will take precedence.

MAIN OFFICE

AMETEK Power Instruments - Rochester
255 N. Union St. Rochester, NY 14605

DEPARTMENT / PRODUCT LINE	TELEPHONE	FAX
MAIN PHONE	585-263-7700	585-262-4777
FIELD SERVICE	800-374-4835	585-238-4945
REPAIRS/RETURNS	888-222-6282	585-238-4945
SALES SUPPORT	800-950-6676	585-454-7805

Far East Office

AMETEK Power Instruments
271 Bukit Timah Road, #03-09
Balmoral Plaza, Singapore 259708
Tel: 65-732-8675
Fax: 65-732-8676