Model N920 Instrument
Embedded Controller

Wiring & Programming Guide
1. Connect input or output into the desired instrument port as shown.

2. Insert power plug into PWR jack as shown.

3. Plug the D9 part of a (C75100AA) RS-232 cable into a computer serial port. Insert the plug on the other end of the cable into the N920 PGM jack as shown.

4. When your unit is installed with the WAN modem option then plug either end of a (C75106AG) cable (RJ-11) into the corresponding jack and the other end of the cable into a standard telephone jack as shown.

5. When relay output option is installed then plug the (C17221AA) cable into the REM jack and connect the wires shown to the controlled equipment.
Model N920 Instrument
Embedded Controller

1) Keypad & Functions
2) Lamp Indicators
3) Navigation & Structure
4) Programming Navigation
5) Viewing Navigation
6) Optional Configuration
Model N920
Embedded Controller

Instrument Keypad & Functions
N920 Key Functions

Basic Key Functions
- **View State**
  - F1: Enter view state
  - F2: Enter program state
  - OTY: View Quantity 1 value
  - RATE: View process rate
  - Zero value being viewed
  - Zero Quantity 2 value

- **Program State**
  - Exit program state
  - View and program values
  - Scroll to next right character
  - Increase blinking value
  - Decrease blinking value

Macro Key Functions
- **View State**
  - F1 + F1: Zero all measured values
  - F1 + F2: Set factory defaults
  - RATE + F1: Start control process
  - RATE + F2: Stop control process
  - RATE + F1: Recall field unit values
  - RATE + F2: Zero field unit measured values
  - RATE + F1 + F1: Zero field unit Quantity 2
  - OTY + RATE: Wide area network log-on dial-out
Model N920
Embedded Controller

Instrument Lamp Indicators
### N920 Lamp Indicators

<table>
<thead>
<tr>
<th>Lamp State</th>
<th>Condition Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRN-GRN</td>
<td>No quantity alarm</td>
</tr>
<tr>
<td>RED-RED</td>
<td>Quantity 1 alarm</td>
</tr>
<tr>
<td>ORN-OFF</td>
<td>Quantity 1 warning</td>
</tr>
<tr>
<td>RED-OFF</td>
<td>Service time alarm</td>
</tr>
</tbody>
</table>

### Lamp Indicators

<table>
<thead>
<tr>
<th>Lamp State</th>
<th>Condition Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRN-GRN</td>
<td>No rate alarm</td>
</tr>
<tr>
<td>RED-OFF</td>
<td>High rate alarm</td>
</tr>
<tr>
<td>ORN-OFF</td>
<td>Low rate alarm</td>
</tr>
<tr>
<td>GRN-OFF</td>
<td>Value report pending</td>
</tr>
<tr>
<td>GRN-GRN</td>
<td>Wide area network log-on in process</td>
</tr>
</tbody>
</table>

NOTE: LAMP STATES SHOWN AS ALTERNATING COLORS WHERE ORN-OFF MEANS CHANGING BETWEEN ORANGE THEN NOT ILLUMINATED
Model N920
Embedded Controller

Instrument Navigation & Structure
### N920 Configuration

<table>
<thead>
<tr>
<th>Prog Value</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity 1 Lim</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity 1 Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity 2 Lim</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity 2 Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Rate Lim</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Rate Lim</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter Constant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate Time Base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate Alarm Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure Units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batch Quantity</td>
<td></td>
<td>Batch Control</td>
</tr>
<tr>
<td>Dose Quantity</td>
<td></td>
<td>Dose control</td>
</tr>
<tr>
<td>Dose Ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay Operation</td>
<td></td>
<td>Monitor-Batch-Dose</td>
</tr>
</tbody>
</table>

### System

<table>
<thead>
<tr>
<th>Prog Value</th>
<th>Prog Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Addr</td>
<td>00000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Date-Time</td>
<td>01Nov05</td>
</tr>
<tr>
<td>Report Start</td>
<td>01Jan06</td>
</tr>
<tr>
<td>Report Freq</td>
<td>000 / min</td>
</tr>
<tr>
<td>Pri Phone</td>
<td>0000000000000000</td>
</tr>
<tr>
<td>Sec Phone</td>
<td>0000000000000000</td>
</tr>
<tr>
<td>Answer Rings</td>
<td>000</td>
</tr>
</tbody>
</table>

* Monitor when Batch OFF and Dose OFF
Model N920
Embedded Controller

Instrument Programming Navigation
**Batch Control Quantity - Output Program**

**Function**
This screen is used to program the quantity that is desired to be delivered upon initiation of Batch processing.

**Navigation**
Access this screen using the F2 (PROG) key until reaching this screen. Note the first numeric field blinks indicating readiness for programming. The screen above will not be included in the program value list when Batch configuration is not selected.

**Select**
- Value - change value by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new selection by pressing the F2 (PROG) key.
Dose Control Values - Output Program

Function
These screens are used to program the values required to support Dose control processing. The Dose Quantity is the amount that an injector delivers into a base quantity when activated. The Dose Ratio is the desired proportion of base quantity divided by the injected dose amount.

Navigation
Access these screens using the F2 (PROG) key until reaching these screens. Note the first numeric field blinks indicating readiness for programming. The screens above will not be included in the program value list when Dose configuration is not selected.

Select
- Value - change value by pressing the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new selection by pressing the F2 (PROG) key.
**Quantity 1 Lim - Input Program**

![Diagram of Quantity 1 Lim - Input Program](image)

**Function**
This screen is used to program the quantity amount above which a quantity 1 alarm condition is declared.

**Navigation**
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first numeric field blinks indicating readiness for programming.

**Select**
- **Field** - select value to change by pressing the QTY (right) key.
- **Value** - change value by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- **Program** - save new selection by pressing the F2 (PROG) key.
Quantity 2 Lim - Input Program

Function
This screen is used to program the quantity amount above which a quantity 2 alarm condition is declared.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first numeric field blinks indicating readiness for programming.

Select
- Field - select value to change by pressing the QTY (right) key.
- Value - change value by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new selection by pressing the F2 (PROG) key.
Quantity 1 and Quantity 2 Set - Input Program

Function
These screens are used to program the associated quantity with a pre-set amount.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first numeric field blinks indicating readiness for programming.

Select
- Field - select value to change by pressing the QTY (right) key.
- Value - change value by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new selection by pressing the F2 (PROG) key.
Time Limit and Report Time - Input Program

Function
This screen has two uses as determined by the Report configuration programmed state.

When Report is Off - this screen becomes Time Limit which is used to program a time amount above which a service time alarm condition is declared.

When Report is On - this screen becomes Report Time allowing periodic reports of measurements to be sent without the need for the real time clock option to be installed.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first numeric field blinks indicating readiness for programming.

Select
- Field - select value to change by pressing the QTY (right) key.
- Value - change value by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new selection by pressing the F2 (PROG) key.
Low Rate Lim

Function
This screen is used to program the rate value below which an alarm is detected.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first numeric field blinks indicating readiness for programming.

Select
- Field - select value to change by pressing the QTY (right) key.
- Value - change value by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new selection by pressing the F2 (PROG) key.
Function
This screen is used to program the rate value above which an alarm is detected.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first numeric field blinks indicating readiness for programming.

Select
- Field - select value to change by pressing the QTY (right) key.
- Value - change value by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new selection by pressing the F2 (PROG) key.
Network Address - System Program

Function
This screen is used to program the base address for serial communication programming and information reporting.

Navigation
Access this screen by pressing the F2 (PROG) key until reaching the desired screen. Note the first character field blinks indicating readiness for programming.

Select
- Field - by pressing the QTY (right) key.
- Character - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new value by pressing the F2 (PROG) key.
**Meter Constant - Input Program**

**Function**
This screen is used to program the factor by which measured pulses are converted to an engineering value in the measure units indicated.

**Navigation**
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first character field blinks indicating readiness for programming.

**Select**
- Field - by pressing the QTY (right) key.
- Value - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new units character string by pressing the F2 (PROG) key.
Time Base - Input Program

Function
This screen is used to program the time base used for input signal rate and quantity measurements in units of seconds, minutes or hours.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the value field blinks indicating readiness for programming.

Select
- Press either RESET 2 (CHAN) (down) or RATE (up) key.
- Press F2 (PROG) key to save the new selection.
Function
This screen is used to program the desired relay contact state conditions. Normal operation without activation criterion causes Form-A relay contacts to be OPEN (un-energized) - and Form-B contacts to be CLOSED (un-energized). Reverse operation causes opposite contact states such as without activation criterion - Form-A contacts CLOSED or Form-B contacts OPEN.

This selection provides a means to pre-determine critical default power loss contact state conditions.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first character field blinks indicating readiness for programming.

Select
- Character - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new units character string by pressing the F2 (PROG) key.
Rate Alarm Type - Input Program

**Function**
This screen is used to program the source of a rate alarm as either from immediate High or Low rate conditions, or long-term average value state. The default setting is Hi-Lo.

**Navigation**
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first character field blinks indicating readiness for programming.

**Select**
- Character - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new units character string by pressing the F2 (PROG) key.
Measure Units - Input Program

Function
This screen is used to program a three character field defining units of measure representing the physical engineering measurement.

Navigation
Access this screen by using the F2 (PROG) key until reaching this screen. Note the first character field blinks indicating readiness for programming.

Select
- Field - by pressing the QTY (right) key.
- Character - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new units character string by pressing the F2 (PROG) key.
Function
These screens are used to program the phone numbers to remotely access computers and data collection equipment to report either one or more alarm conditions, or send scheduled measured information.

Should an alarm condition occur without the primary number programmed - the alarm will be sent to the secondary number to insure alarm information is reported. When scheduled reports are enabled - alarm information will be sent along with the value report which will be delayed by the programmed Report Frequency.

Navigation
Access these screens by pressing the F2 (PROG) key until reaching the desired screen. Note the first character field blinks indicating readiness for programming.

Select
- Field - by pressing the QTY (right) key.
- Character - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new value by pressing the F2 (PROG) key.
Answer Rings - System Program

Function
This screen is used to program the number of public switched telephone system rings after which the
ringing line is answered by the instrument when the modem option is installed. This function is often
used for maintenance, diagnostic, and general remote access purposes. The line will not be
answered if Answer Rings is set to zero.

Navigation
Access this screen by pressing the F2 (PROG) key until reaching this screen. Note the first character
field blinks indicating readiness for programming.

Select
- Field - by pressing the QTY (right) key.
- Character - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new value by pressing the F2 (PROG) key.
Date-Time - System Program

Function
This screen is used to program the real time clock date and time. It is comprised of a date field and a 24 hour clock time field. This screen will not exist in the program list unless the real time option is installed.

Navigation
Access this screen by pressing the F2 (PROG) key until reaching the desired screen. Note the first character field blinks indicating readiness for programming.

Select
- Field - by pressing either the QTY (right) key.
- Character - change by pressing RATE (up) key.
- Program - save new value by pressing the F2 (PROG) key.
**Report Start - System Program**

**Function**
This screen is used to program the date and time that scheduled value reports are to then be sent. It is comprised of a date field and a 24 hour clock time field. This screen will not exist in the program list unless the real time option is installed.

**Navigation**
Access this screen by pressing the F2 (PROG) key until reaching this screen. Note the first character field blinks indicating readiness for programming.

**Select**
- Field - by pressing the QTY (right) key.
- Character - change by pressing RATE (up) key.
- Program - save new value by pressing the F2 (PROG) key.
Reporting Frequency - System Program

Function
This screen is used to program the rate at which measurement information is sent. It is comprised of a three character numeric field, and a time field of either seconds, minutes, hours, days or months. This screen will not exist in the program list unless the real time option is installed.

Navigation
Access this screen by pressing the F2 (PROG) key until reaching this desired screen. Note the first character field blinks indicating readiness for programming.

Select
- Field - by pressing the QTY (right) key.
- Character - change by pressing either the RESET 2 (CHAN) (down) or RATE (up) key.
- Program - save new value by pressing the F2 (PROG) key.
Model N920
Embedded Controller

Instrument Viewing Navigation
Quantity 1 - Input View

Function
This screen is used to independently view and zero the accumulated port quantity 1 when the port time base is set for seconds, minutes, or hours.

Navigation
Access this screen by using the F1 (VIEW) key until reaching this screen.

Zero
Press the RESET 2 (CHAN) key while viewing.
Quantity 2 - Input View

Function
This screen is used to independently view and zero the accumulated port quantity 2 when the port time base is set for seconds, minutes, or hours.

Navigation
Access this screen by using the F1 (VIEW) key until reaching this screen.

Zero
Press the RESET 2 (CHAN) key while viewing.
Rate - Input View

**Function**
This screen is used to view the present process rate when the port time base is set for seconds, minutes, hours.

**Navigation**
Access this screen by using the F1 (VIEW) key until reaching this screen.
Function
This screen is used to view input signal measurement value for install diagnostic purposes. It indicates the value pulse frequency presently being input into the port.

Navigation
Access this screen by using the F1 (VIEW) key until reaching this screen.
Service and Remaining Time - Input View

Function
The Service Time screen is used to view the present accumulated service time. This value is often used for such purposes as maintenance scheduling as a Hobbs Hour-Meter would be used.

The Remaining Time screen counts down the amount of time remaining prior to detecting a Time alarm if a Time Limit alarm value is programmed.

Navigation
Access this screen by using the F1 (VIEW) key until reaching these screens.

Zero
Press the RESET 2 (CHAN) key while viewing the Service Time screen to cause the accumulated hours to be cleared to zero.
Function
This screen is used to view the real time clocks date and time when the real time clock option is installed. The clock field is in 24 hour format.

Navigation
Access this screen by pressing the F1 (VIEW) key until reaching this screen.
Next Report Date-Time - System View

Function
This screen is used to view the date and time that a next regularity scheduled value report is to be sent either from the standard serial port or modem port. The clock field is in 24 hour format.

Navigation
Access this screen by pressing the F1 (VIEW) key until reaching this screen.
Model N920
Embedded Controller

Instrumentation Optional Configuration