



FEATURES

- STABLE READING WITH PULSES DOWN TO ONE PULSE EVERY 5 MINUTES
- ALARM RELAY WITH PROGRAMMABLE DELAY TO 600 sec AND REMOTE RESET
- MULTIPLE INPUTS UP TO 120 Hz, CAN POWER THE SENSOR
- WORKS WITH OPTO-COUPLER FLOW METERS
- WORKS WITH 25 VAC OR DC POWER
- TWO BRIGHT LEDs FOR INPUT AND ALARM
- SEVEN DIGIT RATE WITH PROGRAMMABLE DECIMAL PLACES
- THREE TOTALS, UP TO NINE DIGITS EACH WITH PROGRAMMABLE DECIMAL PLACES. ONE NON-RESETTABLE, TWO RESETTABLE
- KFACTORS FROM 0.00001 TO 9,999,999
- SEPARATE VOLUME UNITS FOR RATE AND TOTAL
- MILLILITERS, LITERS, GALLONS, CUBIC FEET, CUBIC METERS, ACRE FEET
- PER SECOND, PER MINUTE, PER HOUR, PER DAY
- ALL SETTINGS STORED IN A NON-VOLATILE MEMORY
- SETTINGS LOCK/UNLOCK FOR SECURITY
- HIGH CONTRAST IN THE ENTIRE TEMPERATURE RANGE
- SIMPLE PROGRAMMING, SMALL SIZE

APPLICATIONS

- FLOW RATE AND TOTAL MEASUREMENT AND CONTROL
- IRRIGATION

PICTURE COMING SOON

1. DESCRIPTION

NFC130 is a low power flow computer / totalizer with multiple inputs up to 120 Hz and a relay output. It provides power for the sensor and accepts optocouplers, Data Industrial 200 two wire flow meters, reed switches, open drains/collectors npn/pnp, dry contacts, almost any wave and logical signals to measure flow rate and total. NFC130 has a programmable alarm with programmable delay, remote reset input and a bright red LED. It also has a bright green LED for the input pulses.

The alarm relay provides 2 isolated contacts: one normal open (NO) and one normal closed (NC).

The NFC130 software implements a special design for register and optocoupler flow meters which produce very low frequency pulses. Special proprietary algorithms allow NFC130 to accept low frequency pulses like one pulse every 5 minutes and still have a stable reading. In the same time the flow reading can be cleared in half second by external "no flow" switch.

NFC130 is the perfect solution for flow measurement and control applications that require high accuracy and reliability, high isolation, multi-functionality, small size, industrial grade performance and long time without service.

2. ABSOLUTE MAXIMUM RATINGS *

Operating temperature	-20 °C to +70 °C The electronics is industrial (-40 °C to +85 °C) and higher grade . The Liquid Crystal Display (LCD) is limiting the temperature range.
Power supply voltage	33 VAC, 45 VDC
Relay output current	2 A
Relay output voltage	125 VDC, 125 VAC
Relay power	60 W
Current for the sensor	10 mA

*** NOTE: Stresses above those ratings may cause permanent damage to the device.**

3. CHARACTERISTICS

Parameter	Conditions	Min	Typical	Max	Units
Power supply voltage					
AC voltage	-20 °C to +70 °C	21		33	V AC
DC voltage	-20 °C to +70 °C	26		45	V DC
Input					
Input frequency				120	Hz
Voltage for the sensor			10		V DC
Relay Output					
AC current	-20 °C to +70 °C		0.5	2	A AC
DC current	-20 °C to +70 °C		0.5	2	A DC

3.1. BUTTONS

There are three buttons: **SET** , **UP**  and **RIGHT**  :

- **SET** is used to enter and exit menus and confirm options chosen
 - **UP** is used to change the data
 - **RIGHT** is used to move the cursor (blinking digit or icon) to the right
- The buttons have some other special functions that are mentioned below.

There are two types of buttons accepted by the NFC130 flow computer / totalizer:

- Short is when the button is pressed and released in less than 0.5 second
- Long is when it is kept pressed for more than 5 seconds
- All other durations are ignored

NOTE: The UP button will not change the value if the settings are locked.



3.2. INPUTS

NFC130 has three inputs:

- Pulse input from a flow sensor such as optocoupler, Data Industrial 200 two wire flow meters, reed switch, coil, wave, logical signals, open drain/collector, npn, dry contact and others. The computer / totalizer has all pull-up, current limiting and signal conditioning circuits built-in. The input also provides power for the sensor.
- “NO FLOW” switch input. This input is used to immediately clear the rate reading. It can, for an instance, be connected to a pressure switch in the pipe or to a pump’s pressure switch which closes when the pump stops and its pressure drops.
- “ALARM RESET” input. Shorting this input will reset the alarm.

3.3. OUTPUTS

NFC130 has one relay with two isolated contacts: one normal open (NO) and one normal closed (NC). They are controlled by the flow rate alarm. If the flow rate has been higher than the alarm all the time for the duration of the alarm delay, the relay and the red LED will turn on and stay on until the **ALARM RESET** input is shorted.

3.4. DISPLAY

The liquid crystal display (LCD) has 7 digits with 1, 2, 3, 4 or 5 decimal places and many icons. It shows rate, total and all the variables and options that can be set or programmed.

When the display shows rate a “**RATE**” icon is displayed. If it shows total a “**TOTAL**” icon will be displayed along with “**A**”, “**B**” or “**C**” (NFC130 has three totals).

When input pulses are present an “**INP**” (input) icon will be displayed and the green LED will be lit for 0.5 second at every input pulse.

If the flow rate has been higher than the alarm all the time for the duration of the alarm delay, the red LED will turn on and stay on until the **ALARM RESET** input is shorted.

If the total on the LCD is allowed to be reset a “**RESET**” icon will be displayed.

3.4.1. Volume and time units

- NFC130 flow computer has milliliters (**mL**), liters (**L**), gallons (**G**), cubic feet (**CF**), cubic meters (**M³**) and acre feet (**AF**) PER second (**S**), minute (**M**), hour (**H**) and day (**D**). It has separate volume units for rate and total, so for an instance the rate can be in GPM, but the total in AF.

3.4.2. Normal mode

Automatically after turning the power on or exiting a menu NFC130 enters the normal mode. In this mode it can only display:

- Rate



- Total A, B or C. Total A reset can be enabled or disabled and it is stored in a non-volatile memory every 50 seconds or immediately when cleared.

If a total is allowed to be reset the **RESET** icon is shown. Resetting a total is by using long **RIGHT** button.

- Switching between rate, total A, B or C is by using short **UP** button.

3.4.3. Menus

To enter the menus use long **SET** button in normal mode. About 5 seconds after pressing (and holding pressed) the **SET** button the first menu will appear on the LCD:

- **di 200** with a blinking **YES** or **NO** will give you a choice of Data Industrial 200 series two wire flow meter or others.

While in this menu all the settings can be locked/unlocked. Use long **SET**.

- Use short **UP** to lock/unlock the settings. Then use short **SET** to go back to **di 200** menu. If the settings are locked, they can be viewed, but not changed.

Use short **SET** to enter the next menu.

- **KFACTOR** icon along with a blinking decimal point and the KFACTOR number is shown. The decimal places for the KFACTOR can be programmed using **UP** button. KFACTORs ranging from 0.00001 to 9,999,999 can be entered this way. To move from the blinking decimal point away and start entering the **KFACTOR** digits use the **RIGHT** button. This is how many **pulses** the flow computer will receive **per gallon**.

From the **KFACTOR** menu use short **SET** to enter the next menu.

NOTE: the computer will not accept zero for the KFACTOR.

- If a Data Industrial 200 two wire flow meter has been chosen the next menu will be its **offset**. Use its data sheet for its KFACTOR and OFFSET.

Use short **SET** to enter the next menu.

- In the “**Rate volume units**” (**vU**) menu, use **UP** to choose the volume units for the flow rate among **mL**, **L**, **G**, **CF**, **M³** and **AF**. Press short **SET** to move to the “**total volume units**” menu.
- In the “**Total volume units**” (**vU**) menu, use **UP** to choose the volume units for the flow rate among **mL**, **L**, **G**, **CF**, **M³** and **AF**. Press short **SET** to move to the “**time units**” menu.
- In the “**time unit**” (**tU**) menu, use **UP** to choose the time units among **S**, **M**, **H** and **D**. Press short **SET** to move to the “**Rate decimal Places**” menu where (using short **UP**) auto, none, 1, 2, 3, 4 or 5 decimal places for the rate can be programmed.
- Press short **SET** to move to the “**Total decimal Places**” menu where (using short **UP**) auto, none, 1, 2, 3, 4 or 5 decimal places for all totals can be programmed.
- Press short **SET** to move to the “**delay**” menu and program the delay that will keep the display showing



stable flow rate at the very low frequency of the input pulses. Generally the delay should be higher than the highest interval between two input pulses, expected.

- Press short **SET** to move to the **Total A Reset enable/disable** menu. In this menu using **UP** button the total A reset can be enabled or disabled.
If enabled and NFC130 is in normal mode displaying total A, the **RESET** icon will also be displayed and long **RIGHT** will clear total A.
Press short **SET** to move to the next menu.
- Using UP button set the alarm type to high or low. Press short **SET** to move to the **alarm** value menu.
- Enter the alarm for the flow rate. If the flow rate has been higher than the alarm all the time for the duration of the alarm delay, the relay and the red LED will turn on and stay on until the **ALARM RESET** input is shorted.

Press short **SET** to move to the **alarm delay** menu.

- Enter the **alarm delay** in seconds. This delay will prevent the alarm relay from turning on when the flow varies in short intervals. But if the flow rate has been higher than the alarm all the time for the duration of the **alarm delay**, the relay and the red LED will turn on and stay on until the **ALARM RESET** input is shorted.

Because this is the last menu pressing a long **SET** will move the computer to the **LOCK** menu. Use **UP** to lock the settings and press short **SET** to go back to the **alarm delay** menu. General practice would be the settings to be unlocked at the first (**di 200**) menu, then changed and locked again before exiting at this last menu.

Press short **SET** to exit. After a couple of seconds during which all the settings are being checked, validated and stored into the non-volatile memory, the computer will move to the normal mode.

NOTE: There is a time out built-in the software that will reset the computer and force it to the normal mode WITHOUT saving any changes made in any of the menus. The changes will only be saved after exiting the alarm delay menu by pressing short SET.

NOTE: During menus the computer continues to measure and calculate rate and total and control the output so no total will be lost. But changing for an instance the KFACTOR will invalidate the total accumulated. So it would be the user's responsibility to take appropriate actions after changing the settings like resetting the totals or leaving them as they were, for an instance.

3.5. Checking the LCD

All the icons of the LCD can be checked by pressing and holding the **RIGHT** button during turning the power up or after exiting the last menu. Releasing the button will allow the computer to continue to normal mode.

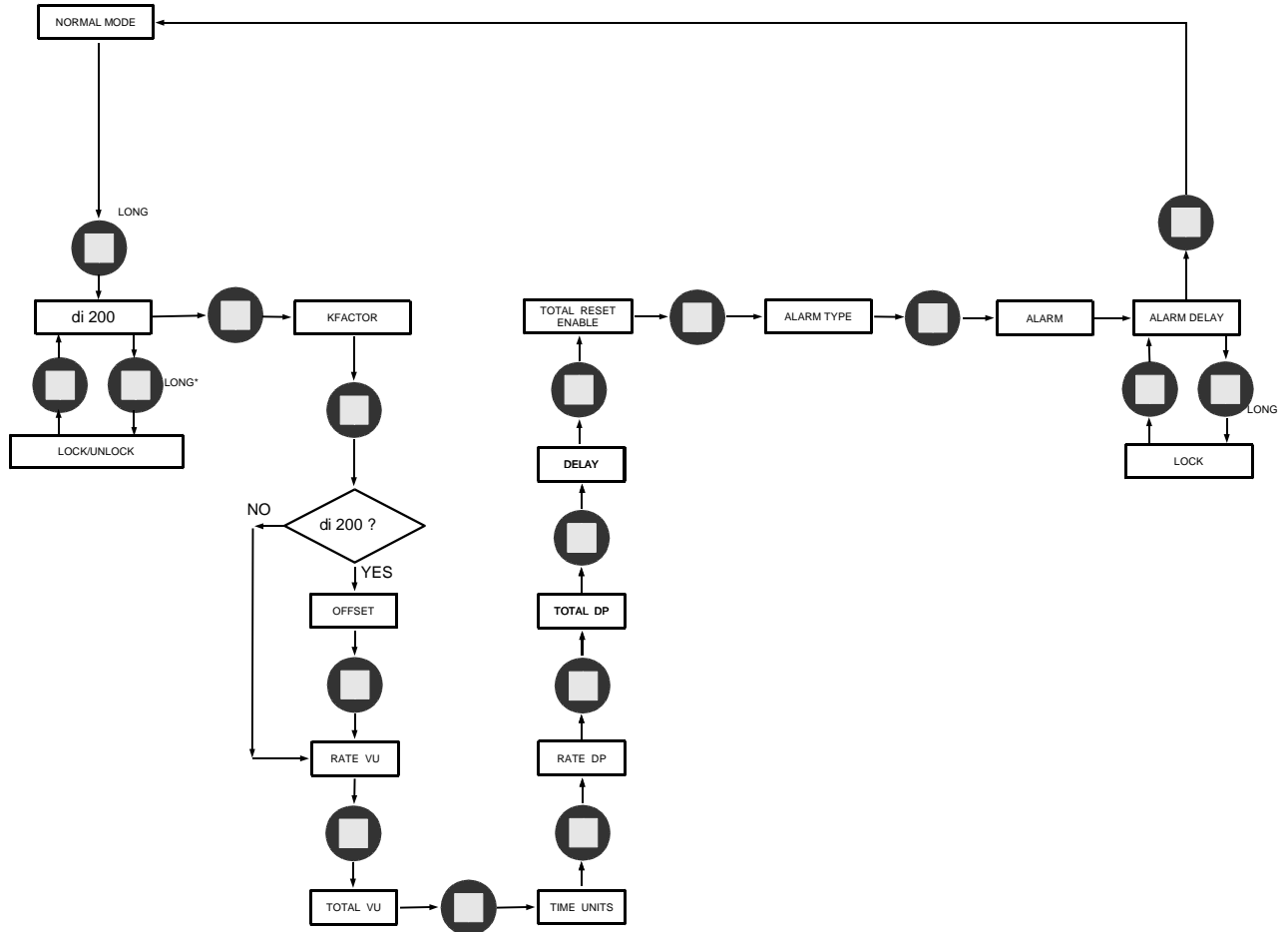
3.6. Removing the power

Total A is stored in the non-volatile memory every 50 second.

Before removing the power make sure that there was no flow for the last minute.

4. MENU DIAGRAM

The menu diagram for NFC130 flow computer / totalizer is shown below.



LONG* - PRESSING LONG SET BUTTON WHEN THE CURSOR IS AT THE RIGHT MOST DIGIT

5. APPLICATION

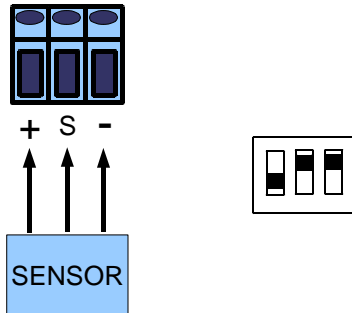
5.1. ELECTRICAL

5.1.1. Wiring the sensor

NFC130 accepts a variety of sensors. See below for wiring different flow sensors:

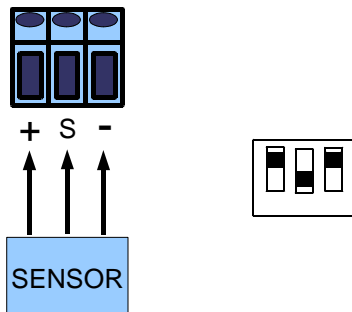
5.1.1.1. NPN Open Drain, Open Collector.

NFC130 powers the flow sensor, 10 VDC / 20 mA max

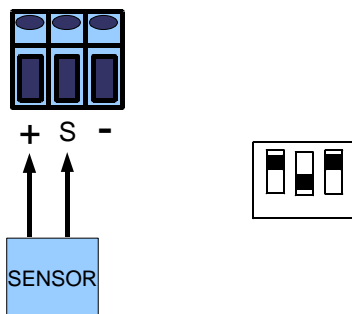


5.1.1.2. PNP Open Drain, Open Collector.

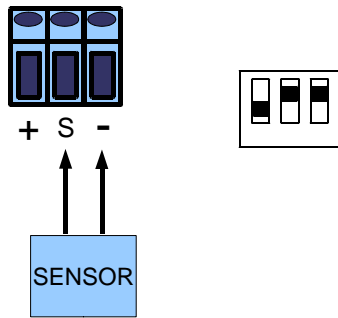
NFC130 powers the flow sensor, 10 VDC / 20 mA max



5.1.1.3. Data Industrial 200 series two wire flow meters.

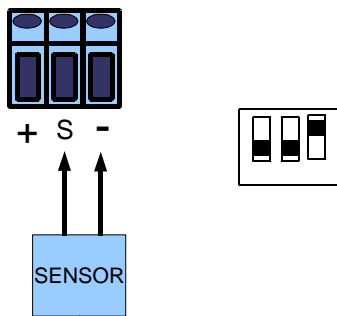


5.1.1.4. Reed Switch, Dry Contact

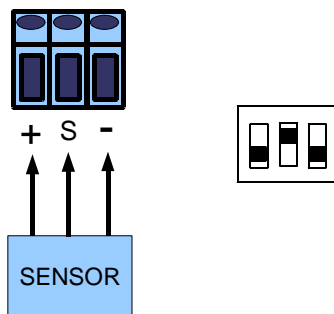


NOTE: A small capacitor in parallel may be needed. Different reed switches and dry contacts have different bouncing time. Test and evaluate carefully to determine the right capacitor.

5.1.1.5. Wave (square, sine, triangle, saw etc.), Logical Signal (CMOS, TTL etc.)



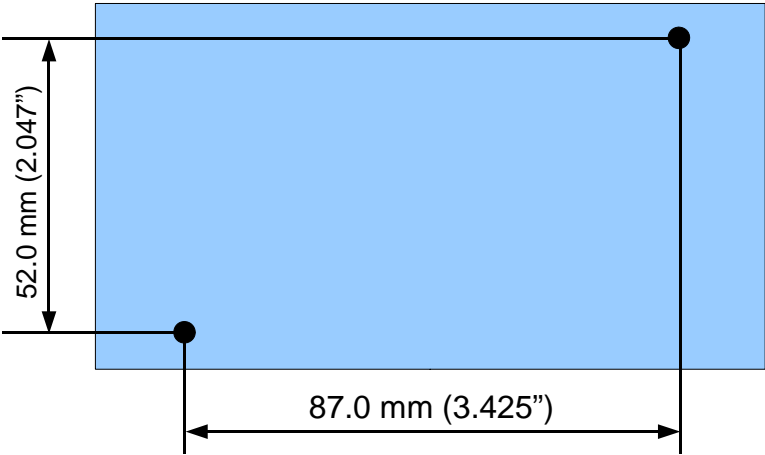
5.1.1.6. Opto-coupler three wire flow meters



NOTE: When wiring an opto-coupler flow meter make sure the 3rd switch on the right is down. If it is up the opto-coupler can get damaged.

5.2. MECHANICAL

Mounting NFC130 on a wall requires an area of 120 x 65 mm (4.73 x 2.56 inch) and two screws:



NOTE: The cable grips and the cables need additional space

6. ORDERING

For ordering please use G Instruments part number 30620.



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