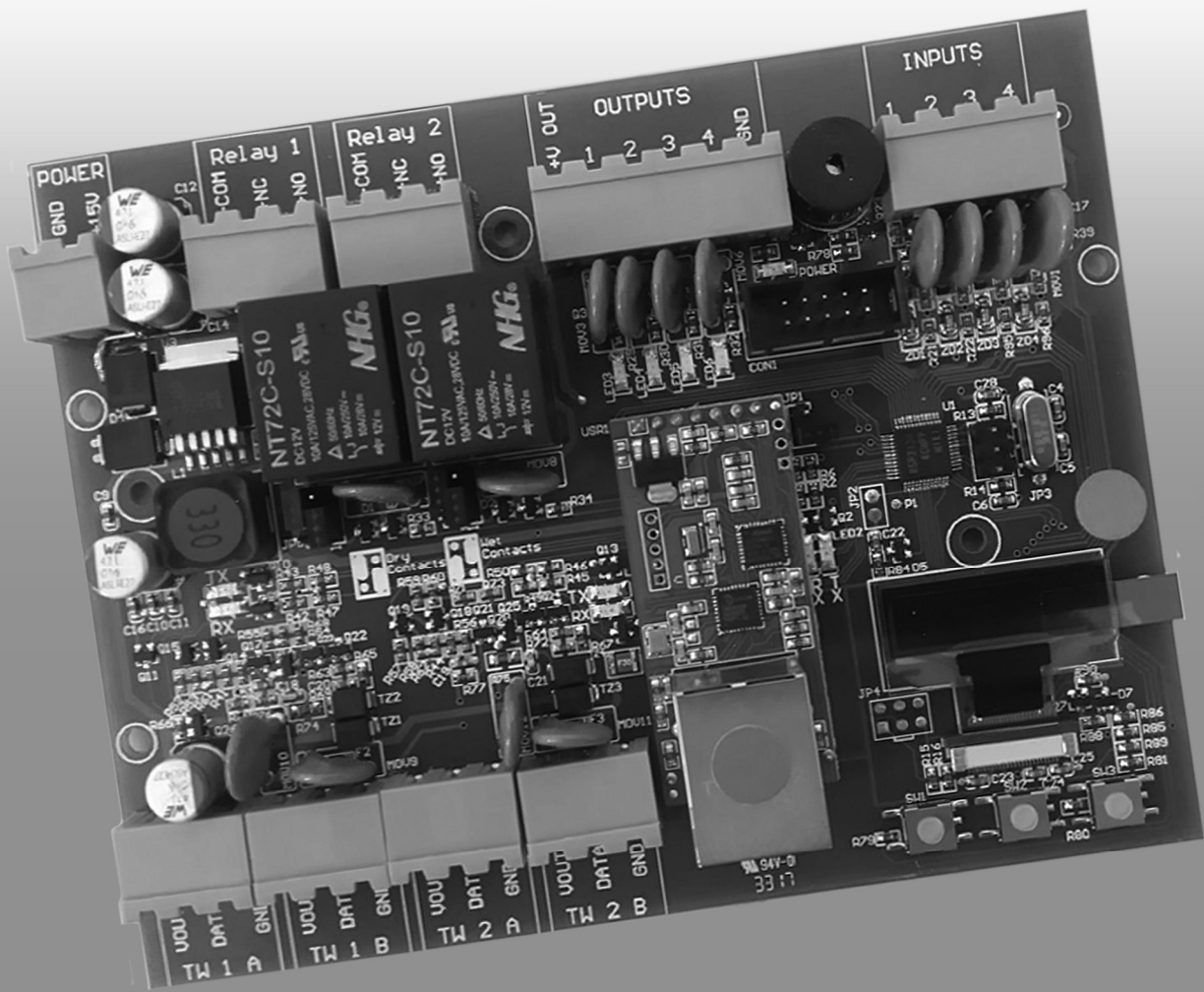


**NEMTEK**  
www.nemtek.com



# Taut Wire Node

Installer Manual



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## 1 INTRODUCTION

The NEMTEK Taut Wire Node provides a communication interface to the NEMTEK Taut Wire sensors and other third-party security systems.

Two separate sensor input channels, each capable of accommodating 31 Taut Wire sensors are provided. Each channel provides a relay output, which will energise a configurable wet or dry contact in an alarm situation. The board can be easily set up by means of the on-board display, pushbuttons and jumpers.

The Node 1 board offers a basic relay interface, whereas the Node 2 board is equipped with an Ethernet port for network connectivity.

It is recommended that the Node board is installed inside the NEMTEK Power Supply Module, which can be powered from a standard 230V/50Hz household socket and includes battery backup in the event of power failure.

## 2 DISCLAIMER

NEMTEK Holdings (Pty) Ltd or any of its subsidiary companies does not guarantee that the operation of the product will be uninterrupted or totally error free.

Product specifications may be altered without prior notification.

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## 4 Hardware Setup

### 4.1 Technical Specifications - Node Board

Parameter	Value
Board Power Supply Requirement (No Taut Wire Sensors)	10-15Vdc/300mA
Board Power Supply Requirement (62 Taut Wire Sensors)	10-15Vdc/830mA
Relay Output Maximum Rating	48Vdc/1.3A
Digital Output Channel Maximum Rating* (per channel)	38Vdc/60mA**
Digital Output +V Out Maximum Rating	500mA
Taut Wire Vout Maximum Rating (per channel)	350mA***
Digital Input Maximum Rating*	-5Vdc to 15Vdc****
Operating Temperature	-20 to 50 °C
Maximum Taut Wire Sensors per channel	31
Number of Separate Sensor Channels	2
Number of Relay Outputs*****	2 (One per channel)
Number of Digital Outputs	4
Number of Digital Inputs	4
Network Communication	RJ45 10/100Mbps Ethernet

\*Digital inputs and outputs can only be configured with network commands

\*\* Outputs are open collector (potential free)

\*\*\*Limited with resettable fuse

\*\*\*\*Inputs have internal pull-up resistors to 5V

\*\*\*\*\*Relay outputs can be configured to be triggered with network commands

### 4.2 Technical Specifications - Recommended Power Supply with battery

Parameter	Value
Main Power Supply*	230Vac/50Hz +-10%/25VA
Output Maximum Rating	13.8Vdc/2A**
Battery Specification	12V/7Ah Rechargeable Sealed Lead-Acid

\*Only for power supply with included mains transformer

\*\*Limited by resettable fuse

## 4.3 Power Supply Installation A

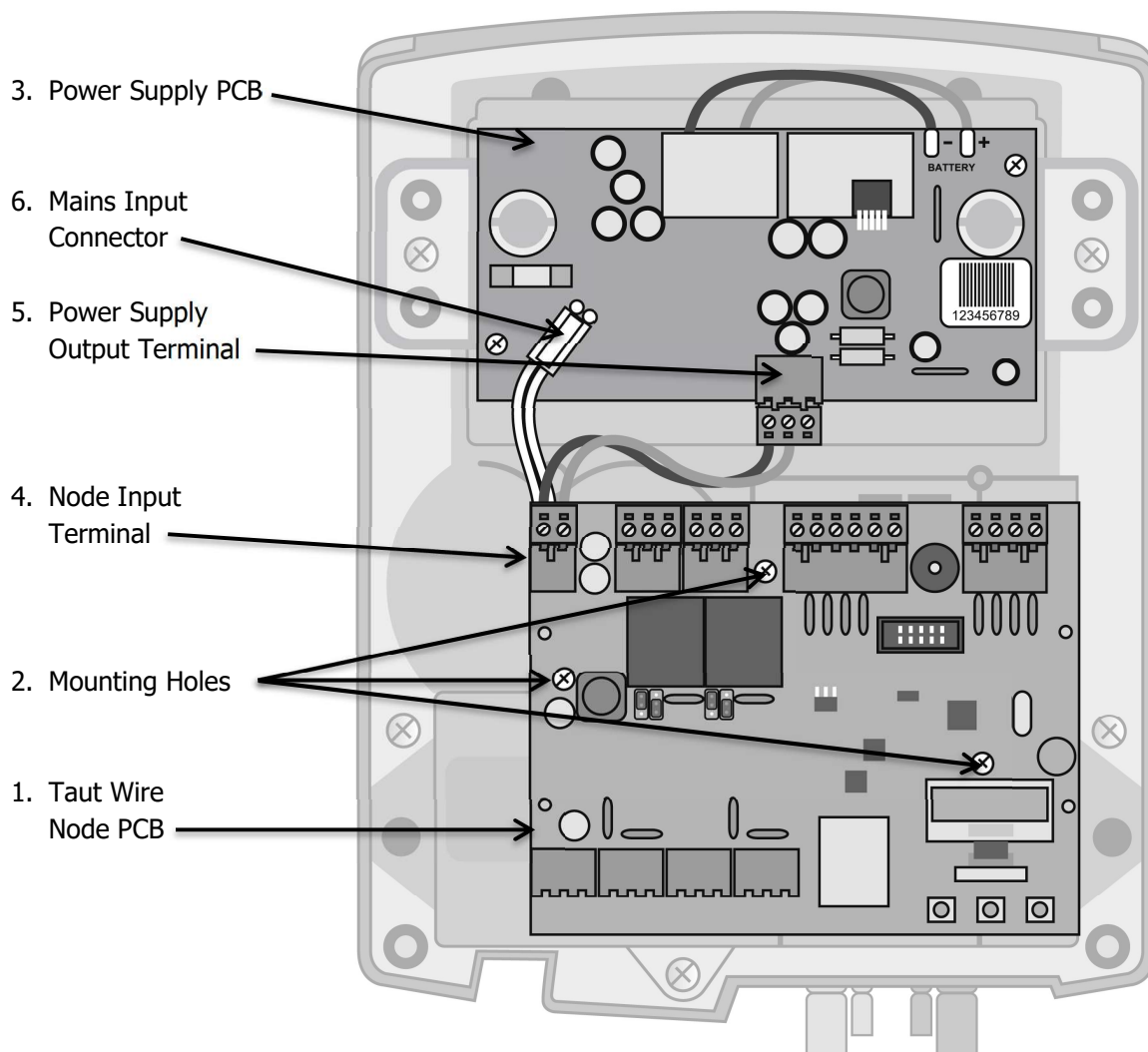
Three power supply options exist for powering the Node board:

- The recommended NEMTEK Power Supply module with battery backup and 230 V mains transformer included.
- The recommended NEMTEK Power Supply module with battery backup with 230 V mains transformer excluded. A suitable mains transformer, with an output of 16 Vac, may be installed to match the mains socket output voltage. The transformer should have a power rating of at least 30 VA.
- Directly powering the Node board, using the on-board connector (see 4.4), with an approved power supply that conforms to the specifications listed in 4.1.

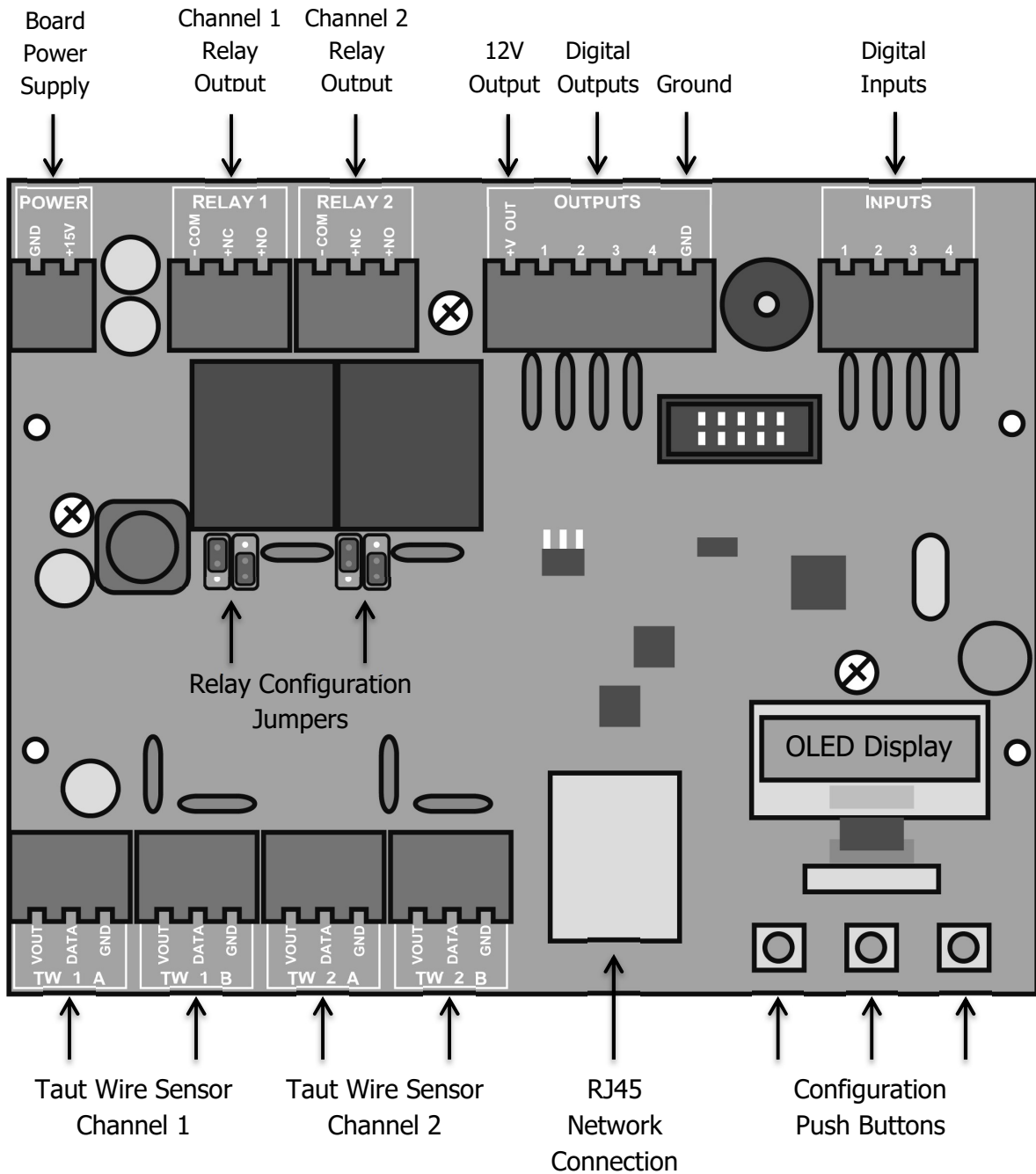
To mount the Node board inside the NEMTEK Power Supply module, follow the steps on the following page:

## 4.3 Power Supply Installation B

- Ensure mains power and battery are disconnected.
- Place the Node board PCB (1) as shown in the diagram, ensuring that the 3 mounting holes (2), align with the screw holes in the power supply unit.
- Connect the Node board to the power supply PCB (3) by using the Node input (4) and power supply output (5) terminals. Take care to use the 12 V supply output and make sure of the polarity as indicated on the PCB!
- On the power supply unit without a mains transformer, connect the mains transformer to the 16 Vac input terminal (6) of the power supply, by using the supplied pigtail wire with connectors.
- Reconnect the battery and fit the cover of the power supply before reconnecting the mains supply.



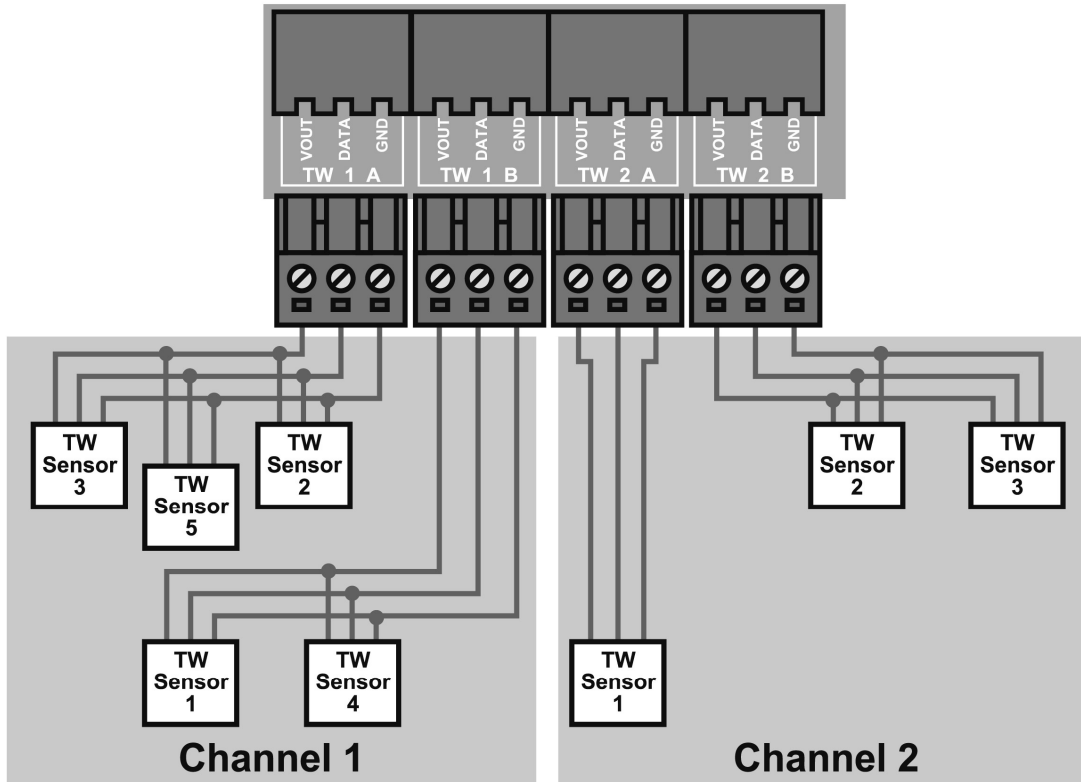
## 4.4 Node Board Layout





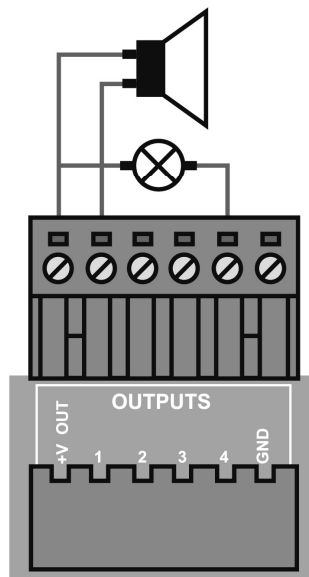
## 4.5 Connection Examples A

### 4.5.1 Taut Wire Sensors



The A and B Inputs are identical and can be interchanged

### 4.5.2 Digital Outputs

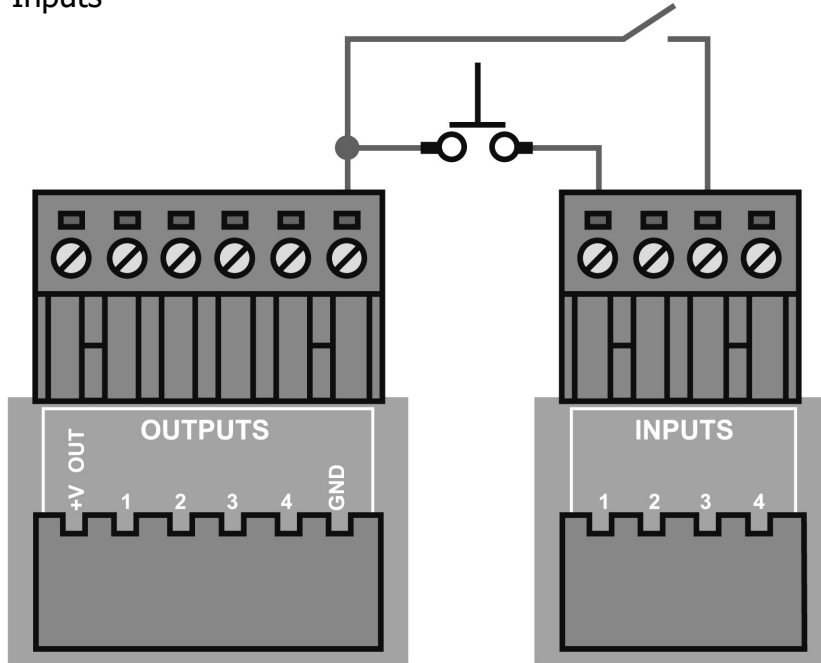


Maximum 38V/100mA per channel

Outputs can only be configured/controlled with network commands

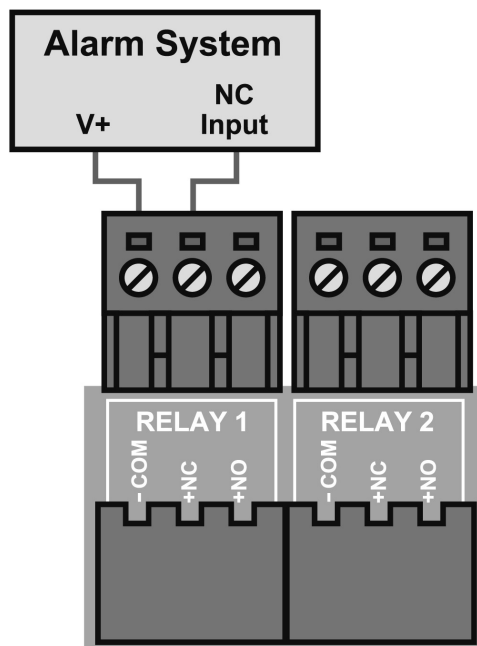
## 4.5 Connection Examples B

### 4.5.3 Digital Inputs



Inputs have internal pull-up resistor to 5V  
Outputs can only be configured/controlled with network commands

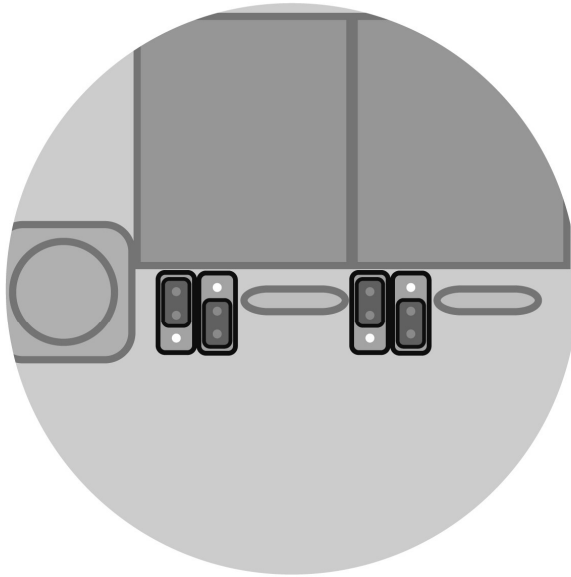
### 4.5.4 Relay Outputs



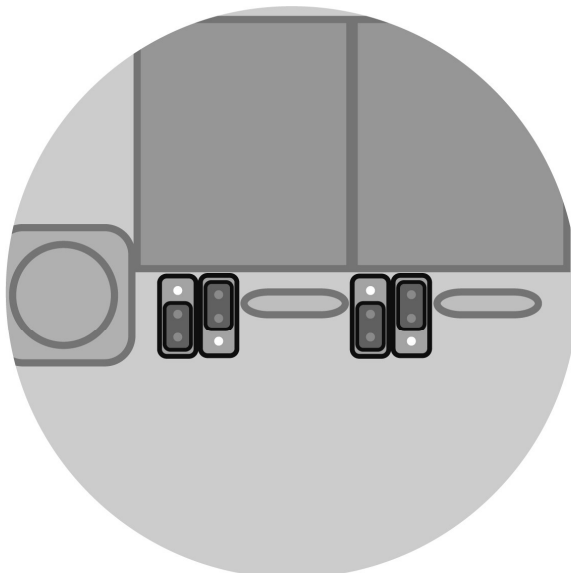
Maximum 48V/100mA per relay  
Jumper settings for wet/dry configuration

## 4.6 Jumper Configuration

The Relay Outputs can be configured to be either a potential free (dry) contact or a wet contact that supplies 12V, by configuring the relevant jumpers, as shown in the figure below. The configuration is also indicated on the board below the jumpers.



Jumpers set for dry contact




Jumpers set for wet contact

## 5 Software Setup A

### 5.1 Startup

The Taut Wire Node is configured using the OLED display and the left, centre and right pushbuttons below the screen.

As soon as power is connected to the unit, the display will briefly show the NEMTEK logo, where after the following default screen is displayed.



```
Sensors Ch1:3 Ch2:2
Vin:12.6V Temp:24
Ch1 ALARM!
```

### 5.2 User Menus

Each menu can be accessed sequentially from the default startup screen, by pressing the right pushbutton. Passed menus can be accessed by pressing the left pushbutton.

#### 5.2.1 Default Menu

This menu is displayed after startup and provides the following information:

- Amount of sensors configured for channel 1
- Amount of sensors configured for channel 2
- Board input voltage
- Ambient temperature at board
- If any channel is in alarm

#### 5.2.2 Tautwire Channel 1 state

- All Taut Wire sensors addresses that are currently in alarm will be displayed next to "Alm: ".
- All Taut Wire sensors addresses that are not connected or experiencing communication errors will be displayed next to: "Com: ".
- Details of the alarms or errors can be seen in "History" menu.

#### 5.2.3 Tautwire Channel 2 state

- The same information mentioned in 3.2.2 is given for channel 2.

#### 5.2.4 History Channel 1

- The alarm and error history for all configured sensors on channel 1 are given in a three-digit code for sensors 1 - 9 and a four-digit code for sensors 10 - 31. The leftmost digit for sensor 1 - 9 and leftmost 2 digits for sensors 10 - 31 represent the sensor address that is in alarm/error state. The 2 rightmost digits represent an accumulation of all past event and alarm conditions. Refer to appendix A for a list of possible error/alarm codes.
- The alarm and error history can be cleared by holding the centre pushbutton for 2 seconds.

## 5 Software Setup B

### 5.2.5 History Channel 2

- The alarm and error history for all configured sensors on channel 1 are given. Refer to 3.2.4 for further detail.

### 5.2.6 Event Log

- All system events and the time of the event can be viewed.
- Use the centre pushbutton to enter and exit the log and the left and right pushbutton to cycle through the log.
- Log entries cannot be deleted.
- If an event recurs within a configurable amount of time, the event will only be logged once in that time. Refer to section 3.3.3 to change the time threshold.

### 5.2.7 System restart

- The software revision is displayed here.
- Hold the centre pushbutton for 2 seconds to initiate a system restart. Any unsaved configuration changes will be lost.

## 5.3 Installer Menus

The installer menus can be accessed by holding down any of the pushbutton during system power up or restart. Like the user menus, scrolling through the different menus is done with the left and right pushbuttons.

To automatically address a new installation, execute the following steps in order, by referring to the relevant menus below:

- Decommission channel 1/2 (section 5.3.1.1)
- Count sensors on channel 1/2 (section 5.3.1.2)
- Address sensors on channel 1/2 (section 5.3.1.3)
- Exit the channel installer menu (section 5.3.1.6)
- Save the configuration (5.3.4)

### 5.3.1 Channel 1 installer menu

Channel 1 can be configured by pressing the centre pushbutton to access the following submenus:

#### 5.3.1.1 Decommission Channel 1

- Pressing the centre pushbutton for 2 seconds will clear all Taut Wire sensor addresses to 0 and return the sensor alarm threshold to factory default.
- This action should be performed on all new installations, BEFORE continuing with sensor addressing.

## 5 Software Setup C

### 5.3.1.2 Count sensors on Channel 1

- All addressed and unaddressed sensors connected to channel 1 will be counted.
- Unaddressed sensors under strain ("in alarm") and addressed sensors ("non 0") will be shown. These sensors will not be able to be configured with a new address and need to be relieved of any strain and decommissioned before continuing with addressing.
- The sensor count value in 3.2.1 will be automatically updated with the number of sensors detected in this menu, when the configuration is saved (see 3.3.4).
- During the count process, which takes about 5 seconds, random beeps will be heard for each sensor found in a decommissioned network.
- Performing a sensor count on a commissioned network, will produce a rapid and evenly distributed beep sequence.

### 5.3.1.3 Address sensors Channel 1

- Before commencing sensor addressing ensure no sensors are in alarm.
- Press the centre pushbutton to start the addressing sequence.
- The default starting address is 1. This value can be changed manually with the left and right pushbuttons if a different sensor address needs to be programmed. Note that sensor addresses must be filled sequentially and it is not allowed to have 0 addresses between non 0 addresses. For example, addressing 4 sensors as 2, 8, 9 and 12 is not allowed.
- Once the required address is chosen, apply slight pressure to the Taut Wire sensor by hand, until a beep sound is heard and the address counter increments. The sensor is now addressed. If there is no response when pressure is applied, it is possible that the sensor already has a non 0 address. Refer to 3.3.1.1 to clear the sensor address.
- Repeat the process for all unaddressed sensors. When finished, press the centre pushbutton to stop the process.

## 5 Software Setup D

### *5.3.1.4 Set Channel 1 total sensors*

- Although the total sensor value is automatically set in 3.3.1.2, it is possible to set it manually.
- Press the centre pushbutton to access the sensor amount and use the left and right pushbuttons to increase or decrease the value. Press the centre pushbutton again to select a value.
- The sensor count in 3.2.1 will be updated when the configuration is saved (see 3.3.4).
- Note that if the selected sensor count is less than the actual sensors connected to the board, the additional sensors will be ignored. For example, if 10 sensors are selected and 12 sensors are connected, the last 2 sensors will be ignored.
- Note that if the selected sensor count is more than the actual sensors connected to the board, the additional sensors will generate a communication error. For example, if 12 sensors are selected, but only 10 sensors are connected, the additional 2 sensors will generate a communication error.

### *5.3.1.5 Set Channel 1 comms fail*

- The threshold sets the amount of times the board will try to establish communication with the sensors, before generating a communication alarm. The value can be adjusted by pressing the centre pushbutton, selecting a value with the left and right pushbuttons and pressing the centre pushbutton again.
- This configuration needs to be saved before it will take effect (see 3.3.4).

### *5.3.1.6 Exit installer menu*

- Press the centre pushbutton to exit the Channel 1 installer menu. Note that any changes need to be saved before restarting (see 3.3.4).

## 5 Software Setup E

### 5.3.2 Channel 2 installer menu

The installer menu for channel 2 is exactly the same as for Channel 1.  
Refer to 3.3.1.

### 5.3.3 Log repeat interval

- If a log event recurs within this interval time, only the first instance will be logged and all subsequent identical events will not be recorded.
- To change the hours value, press the centre pushbutton and increase or decrease the value. Press the centre pushbutton again to select the hour value and move to the minute value. Press the centre pushbutton to select the value.
- Note that the change needs to be saved before it will take effect (see 3.3.4).

### 5.3.4 Set TW Node address

- Set the network address, from 1 to 63, for the Node.
- This is the address of the Node that will be displayed on the FG7 network controller and Fenceprobe software, and should not be confused with the IP address. For more information, refer to the NEMTEK Network Guide.

### 5.3.5 Save configuration

- All configuration changes in the installer menu need to be saved before the changes will take effect.
- Hold the centre pushbutton for 2 seconds to save the current configuration.

### 5.3.6 System restart

See 3.2.7



## Appendix A: Error/Alarm Codes

The following tables detail the error/alarm codes that can be generated in the history (see section 5.2.4 & 5.2.5). The second digit from the right represents the communication error and the last digit represent the Taut Wire sensor alarm, in hex format. If more than one error and/or alarm have been generated, the second digit from the right will be an accumulation of all errors and the last digit will be an accumulation of all alarms. For example, if a sensor left and sensor right alarm occurred, the digit will be 2 + 1 = 3. The following table displays the error digit and alarm digit of the error code:

Digit	Description	Solution
<b>Communication Errors (second digit from right)</b>		
0	No Communication Error	
1	Communication Error	Unstable communication to sensor. Check connections and wiring.
2	Communication Fail Error	Sensor communication lost. Check connections and wiring.
3	Communication Error and Communication Fail Error	Unstable communication to sensor. Check connections and wiring.
<b>Sensor Alarms (last digit)</b>		
0	No Sensor Alarms	
1	Sensor Right*	Check intrusion
2	Sensor Left*	Check intrusion
3	Sensor Left and Right*	Check intrusion
4	Service Right*	Sensor at stress limit to right. Reset tension on sensor.
5	Sensor and Service Right*	Check intrusion, reset tension on sensor
6	Sensor Left and Service Right*	Check intrusion, reset tension on sensor
7	Sensor Left and Right and Service Right*	Check intrusion, reset tension on sensor
8	Service Left*	Sensor at stress limit to left. Reset tension on sensor.
9	Sensor Right and Service Left*	Check intrusion, reset tension on sensor
A	Sensor Left and Service Left*	Check intrusion, reset tension on sensor
B	Sensor Left and Right and Service Left*	Check intrusion, reset tension on sensor
C	Service Left and Right	Unstable communication to sensor. Check connections and wiring.
D	Sensor Right, Service Left and Right	Unstable communication to sensor. Check connections and wiring.
E	Sensor Left, Service Left and Right	Unstable communication to sensor. Check connections and wiring.
F	Sensor Left and Right, Service Left and Right	Unstable communication to sensor. Check connections and wiring.

\*Sensor mounted with NEMTEK logo on top and wire clamp facing towards installer

## Installer Notes

- There are no user serviceable parts on the Node board.
- The board should be installed inside a suitable enclosure, away from excessive heat and damp.
- Never exceed the maximum ratings given in section 4, as this may lead to permanent damage to the board.
- Do not install the Taut Wire sensor communication wires near electric fence or other high voltage or current carrying conductors.

**Rev D, 20 March 2019**

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