

# Technical Manual for the PNM-100

Version 1.20



## Introduction

The Logic IO PNM-100 product is a complete solution using the Navigation and Messaging Platform designed for the most demanding and professional fleet management applications. The PNM device is a ruggedized 7-inch, easy to read, screen optimized for finger touch usage. A powerful processor and generous RAM and Flash insure a delightful experience. The PNM-100 product comes with the PNM software/maps pre-installed and interface cables for the RTCU MX2i pro/pro+, RTCU CX1 flex/pro and the RTCU SX1 series. *Ready to go!*

This technical manual describes the installation of the PNM-100, and the technical details of the system. For controlling the PNM device from the VPL user application refer to the RTCU online help, and for detailed information on the NMP software interface refer to the documentation of the Navigation and Messaging Platform.

The NMP software and the Sygic maps are pre-installed on the PNM device and activated according to the user agreement. Please refer to the NMP software documentation for detailed information.

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## Graphical view



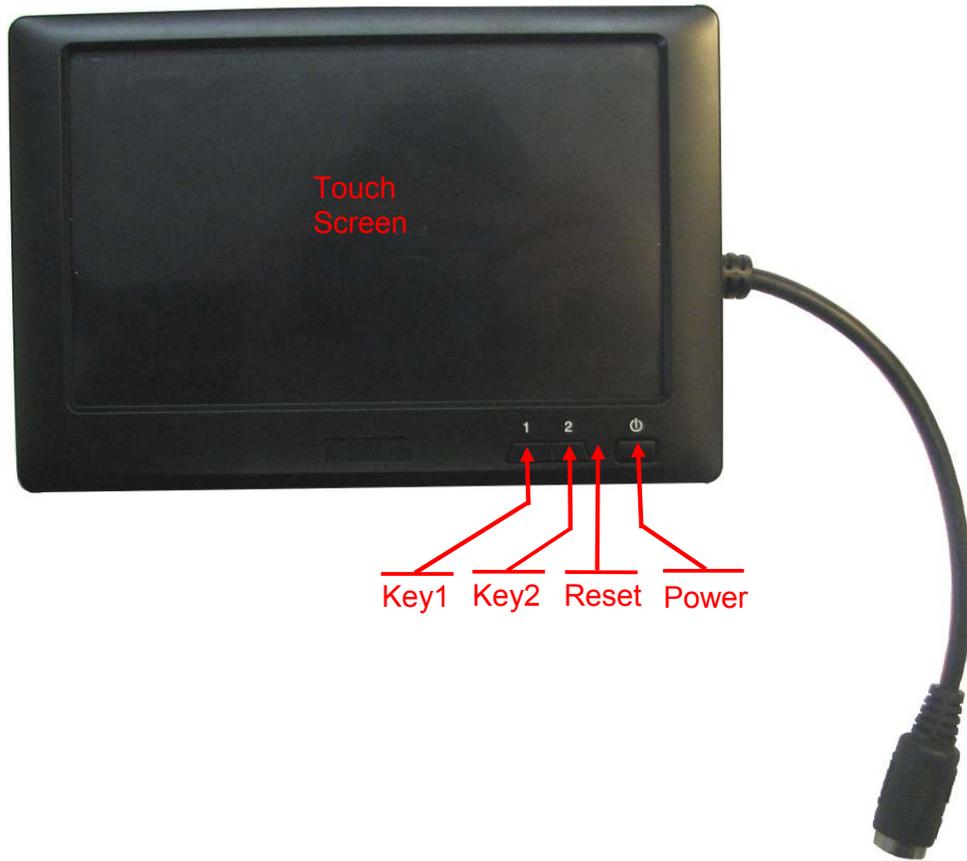
## Package overview

The package of the PNM-100 includes the following items:

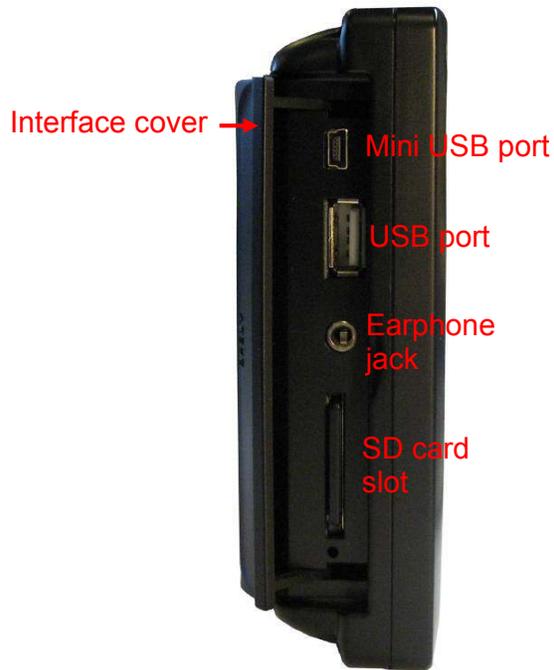


Quantity	Item	Description
1	PNM-100 device	Windows CE5.0 device
1	Mounting Bracket	PNM-100 device mounting bracket
1	PNM interface box	Interface to the PNM-100 device
1	SD-CARD	With pre-installed software
1	1.5 m RJ-45 – flying leads cable	Connection cable between PNM interface box and RTCU CX1 flex/pro and the RTCU SX1 series.
1	2 m Power cable	Power cable to the PNM interface box
1	2 m RJ-45 Patch cable	Connection cable between the PNM interface box and the RTCU MX2i pro/pro+
1	1.5 m RJ-45 – DIN13 cable	Connection cable between PNM device and the PNM interface box

**PNM-100 Overview**



Interface	Description
Power	Power ON/OFF. Can only be used when the device is enabled
Reset	Restarts the system
Key1	Shortcut key for sound on/off. No visual indication on the display.
Key2	Shortcut key for adjusting brightness.
Touch Screen	To interact with the application using finger touch

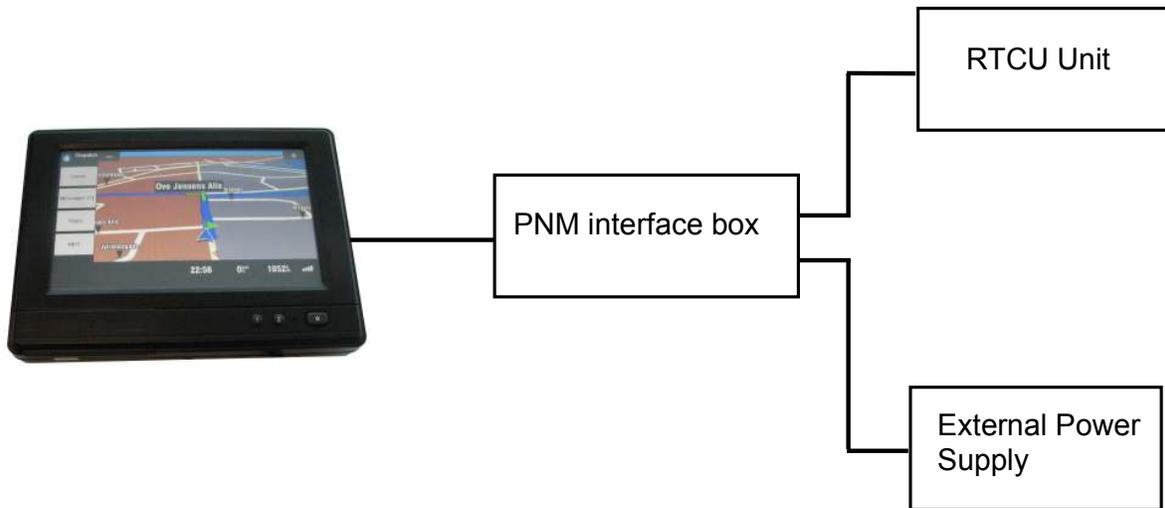


Interface	Description
Mini USB Port	Mini USB 2.0 for ActiveSync and USB Host 1.1
USB Port	Connection with USB mouse or USB device
Earphone jack	Connection with a stereo earphone
SD card slot	SD card reader for storing the map or other data



### Typical System Connection

A typical system installation is illustrated below:



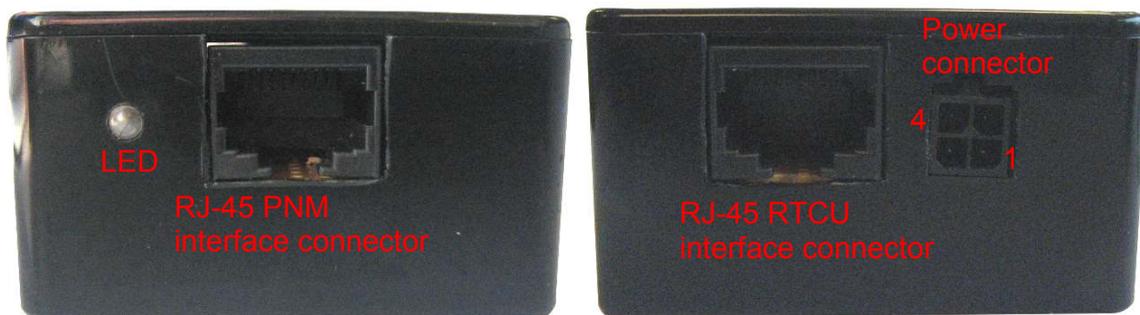
## PNM interface box

The interface box includes communication, power regulation, protection and control circuit of the PNM device. In the following the sections the external connections to the device interface has been described.

## External connections

### Overview

Below is a detailed graphical overview of the external connections to the PNM interface box, followed by a detailed description of each of the connectors.



### Power connector

The 4-pole TYCO power connector is only to be used when interfacing with the RTCU MX2i pro/pro+ and the RTCU SX1 series. When the PNM interface box is connected to the RTCU CX1 flex/pro the PNM-100 is powered through the RJ45 connector. The PNM interface box must be supplied between 12...36 VDC from an external DC power source connected to the PWR connector.

- Positive power is applied to pin 1.
- Ground is applied to pin 4.

The PNM interface box is protected against wrong polarity. However if the box is polarized wrong while the connected RTCU unit is correct polarized, and power is applied, the internal GND connection will be broken. For avoidance of such a scenario a fuse can be installed on the positive supply.

### PNM interface connector

This connector includes the power supply and the communication signals to the PNM device. The PNM device can be connected using the supplied RJ-45-to-DIN13 cable.

**RTCU interface connector**

Using this RJ-45 connector the RTCU unit can be connected to the PNM interface box and control the power of the PNM device. The different kinds of RTCU units have their own interface cable to the PNM interface box. Please see the section “Typical Application” for further information.

**LED**

The LED indicates the power status to the PNM device.

**Activity LED**

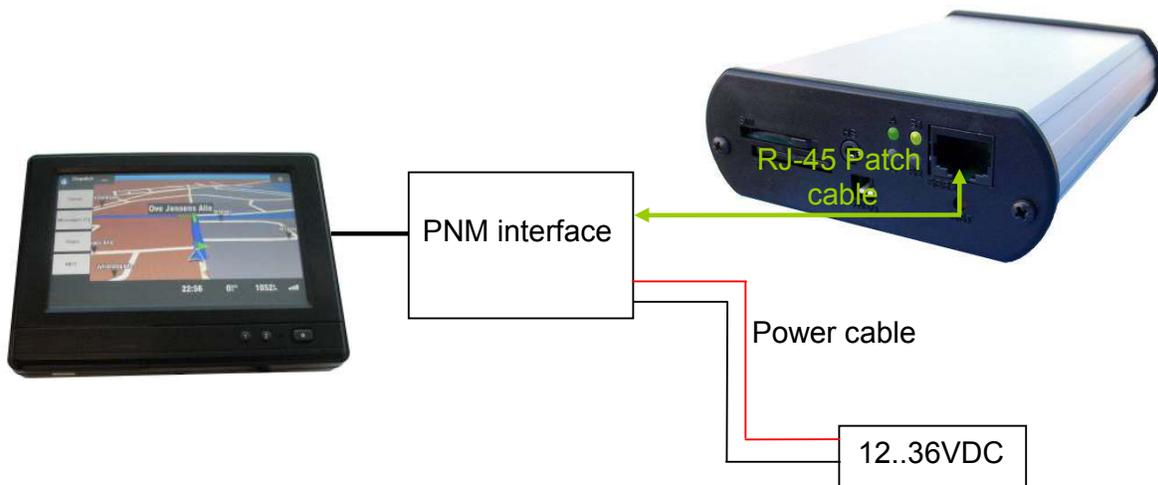
Pattern	Description
On	Power is enabled to the PNM device
Off	Power is disabled to the PNM device

## Typical Application

This is a quick start guide to connect the PNM device to the supported RTCU unit. It's easy to install the PNM system on location with the supplied cable for the RTCU MX2i pro/pro+, RTCU CX1 flex/pro and the SX1 series. The following sections will describe the system connection to the supported RTCU units.

### Interfacing to the RTCU MX2i Pro/Pro+

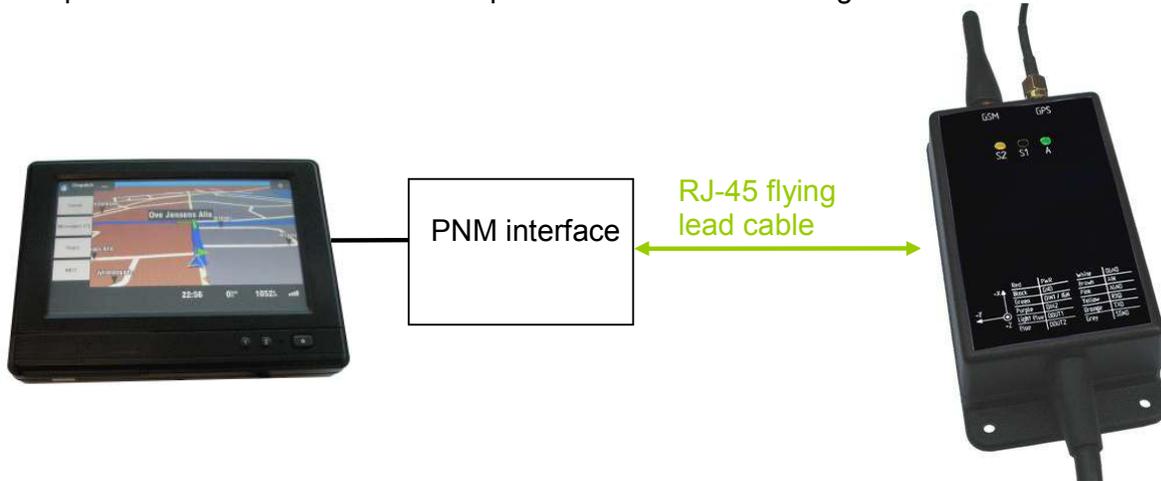
The RJ-45 patch cable needs to be connected to the 8-pole serial port 2 connector and the PNM interface box. The PNM interface box is supplied from an external DC supply using the power cable. An example of connection to RTCU MX2i pro is shown in the drawing below.



1. Check that the control switch **S4** in the PNM interface box is in position **B**. The interface box is delivered with this configuration by default. Please refer to Appendix B for location and configuration of the switch.
2. Connect the RJ45 - DIN13 interface cable between the PNM device and the PNM interface box. Please note the correct orientation of the DIN13 connector.
3. Connect the PNM device interface to the serial Port 2 of the RTCU MX2i pro with the supplied RJ-45 patch cable.
4. Connect the power supply to the power connector of the PNM interface box. Power requirement is 12..36VDC. The black wire is (-) and the red wire is (+). Note that the power to the PNM device is controlled by the RTCU MX2i pro application. The module will not power on unless the RTCU MX2i pro is powered on and the application enables the module. Please refer to the RTCU IDE online help for enabling and using the NMP interface.

### Interfacing to the RTCU CX1 flex and RTCU CX1 pro

The RJ-45 flying lead cable needs to be connected to the RJ-45 connector of the PNM interface box and to the RTCU CX1. The PNM interface box does not require any external DC supply, and will be supplied directly through the digital output #2 of the RTCU CX1. An example of connection to RTCU CX1 pro is shown in the drawing below.



The flying lead cable is color coded, and these colors will be used in the following description:



*Note: Only the used colored wires are shown*

As seen on the above picture, there are 5 signals to be connected to the CX1. The cable colors and the signal names are given in the following table:

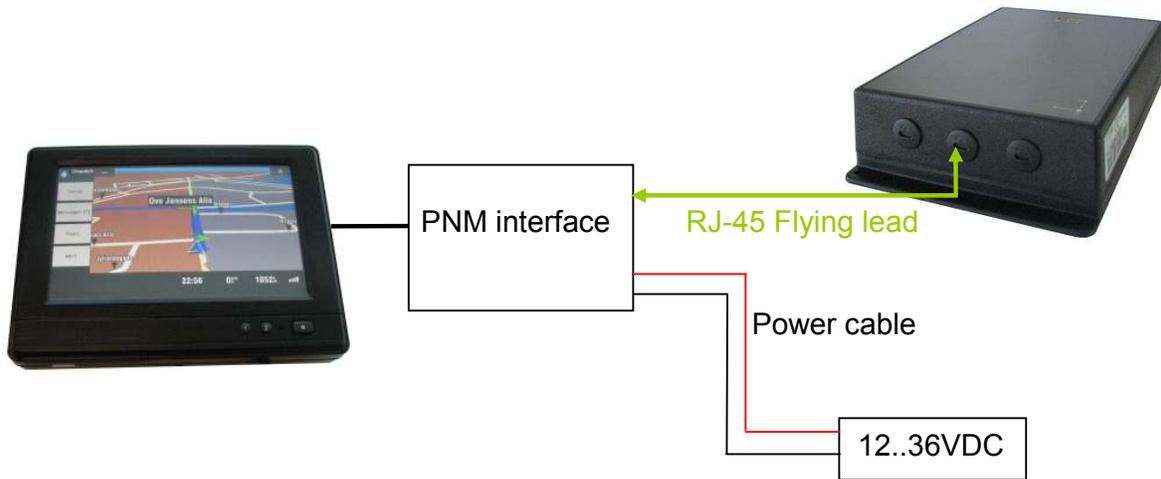
Color on RJ-45 flying lead cable	Color on CX1 interface cable	Signal Name
Green/white	Blue	DOUT2
Orange/white	Blue	DOUT2
Blue	White	DGND
Green	Orange	TXD
Blue/white	Yellow	RXD

1. Check that the control switch **S4** in the PNM interface box is in position **B**. The interface box is delivered with this configuration by default. Please refer to Appendix B for location and configuration of the switch.
2. Connect the RJ45 - DIN13 interface cable between the PNM device and the PNM interface box. Please note the correct orientation of the DIN13 connector.
3. Connect the 5 colored cables to their respective signals on the RTCU CX1 interface cable as mentioned in the table above. Please refer to RTCU CX1 Technical Manual for additional information on the interface cable.
4. Enable the PNM interface from the RTCU CX1 through the user application. Note that the power to the PNM device is controlled by the RTCU CX1. The module will not power on unless the RTCU CX1 is powered on and the application enables the NMP interface. Please refer to the RTCU IDE online help for enabling and using the NMP interface.

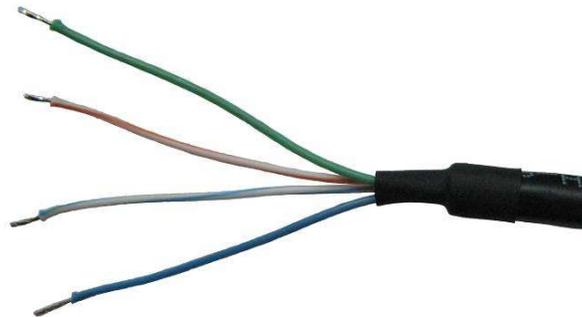
**Note: When using the PNM device with the RTCU CX1 digital output 2 is reserved for this purpose and can not be used by the application. Using digital output 2 for this purpose does not require the IO option on the RTCU CX1 flex, but will require the RS232/FMI option.**

### Interfacing to the RTCU SX1 series

The RJ-45 flying lead cable needs to be connected to the RJ-45 connector of the PNM interface and the RTCU SX1. The PNM interface box is supplied from an external DC supply using the power cable. An example of connection to RTCU SX1 is shown in the drawing below.



The flying lead cable is color coded, and these colors will be used in the following description:



*Note: Only the used colored wires are shown*

As seen on the above picture, there are 4 signals to be connected to the SX1. The cable colors and the signal names are given in the following table:

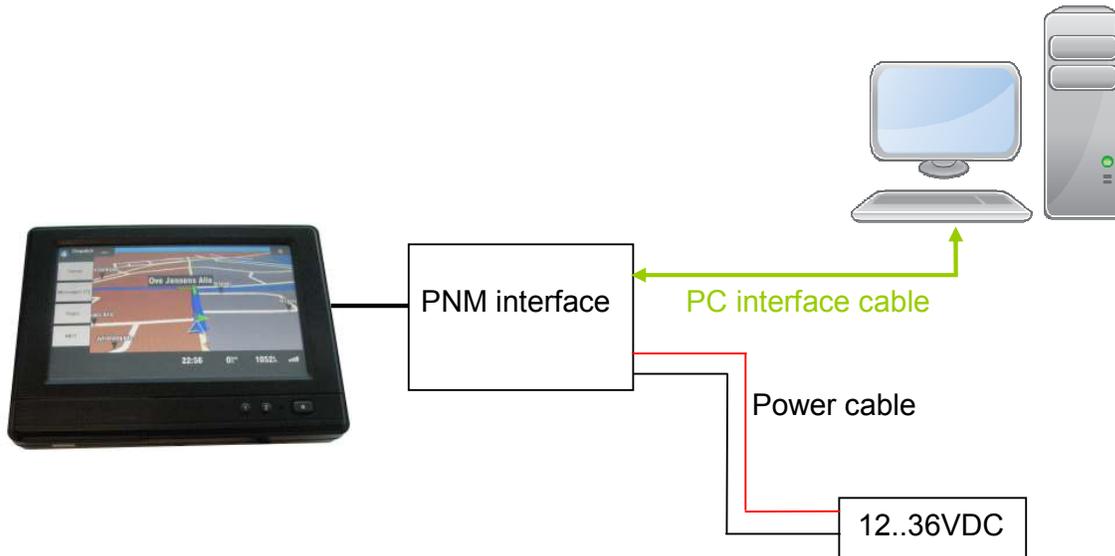
Color on RJ-45 flying lead cable	Signal Name
Brown/white	DOUT2
Blue	DGND
Green	TXD
Blue/white	RXD

1. Check that the control switch **S4** in the PNM interface box is in position **A**. This switch is in position B by default. Please refer to Appendix B for location and configuration of the switch.
2. Connect the RJ45 - DIN13 interface cable between the PNM device and the PNM interface box. Please note the correct orientation of the DIN13 connector.
3. Connect the 4 colored cables to their respective signals on the RTCU SX1 screw terminals as mentioned in the table above. Please refer to RTCU SX1 Technical Manual for additional information on the screw terminals.
4. Connect the power supply to the power connector of the PNM interface box. Power requirement is 12..36 VDC. The black wire is (-) and the red wire is (+). Note that the power to the PNM device is controlled by the RTCU SX1. The module will not power on unless the RTCU SX1 is powered on and the application enables the NMP interface. Please refer to the RTCU IDE online help for enabling and using the NMP interface.

**Note: When using the PNM device with the RTCU SX1 series digital output 2 is reserved for this purpose and can not be used by the application.**

### Interfacing to the RTCU IDE Simulator

The PNM-100 is supported by the RTCU IDE simulator. In order to connect the PNM-100 to the PC an optional cable with the order code **RT-PNM-PC** is needed.



1. Check that the control switch **S4** in the PNM interface box is in position **B**. The interface box is delivered with this configuration by default. Please refer to Appendix B for location and configuration of the switch.
2. Connect the RJ45 - DIN13 interface cable between the PNM device and the PNM interface box. Please note the correct orientation of the DIN13 connector.
3. Connect the PNM device interface to one of the available serial ports on the PC with the PNM-100 PC interface cable.
4. Connect the power supply to the power connector of the PNM interface box. Power requirement is 12..36VDC. The black wire is (-) and the red wire is (+). Note that the power to the PNM device is controlled by RTCU IDE application. The module will not power on unless the RTCU IDE Simulator is running and the user application enables the module. Please refer to the RTCU IDE online help for enabling and using the NMP interface.

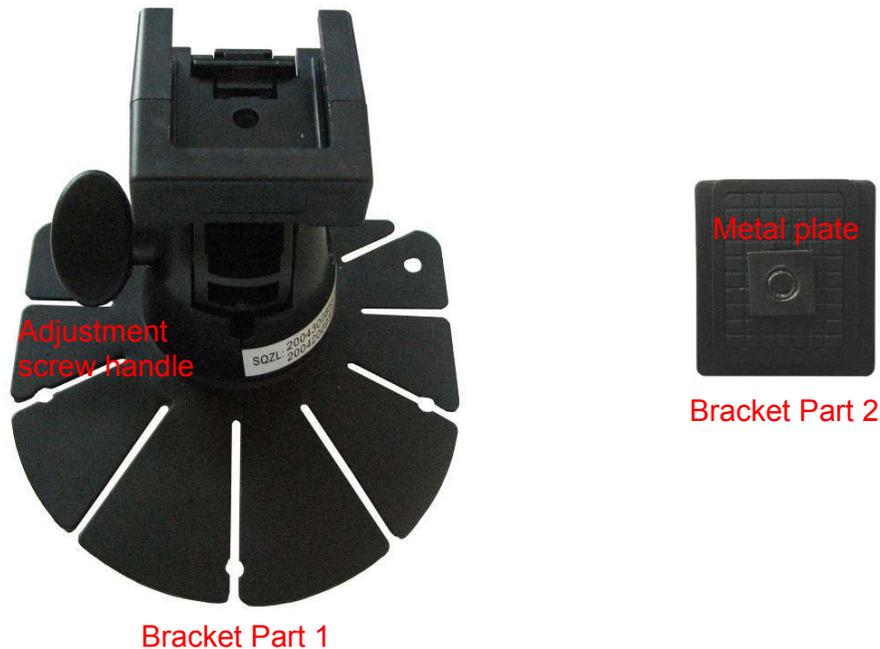
### Specifications for PNM-100

Power supply	Min	Typ	Max		
Operating Voltage	12	-	36	VDC	Protected against wrong polarity.
Power Consumption		<10		W	The RTCU unit is not included
Core	Processor		S3C2416, 400 MHz		
	Flash		2 GB NAND		
	SDRAM		128 MB		
LCD	Size		7'' diagonal TFT		4-wire resistive touch screen
	Resolution		800 x 480		
	Aspect Ratio		16:9		
	Contrast		500:1		
	Brightness		300 cd/m <sup>2</sup>		
	Viewing Angle		70/70(L/R), 50/70(U/D)		
Storage temperature	-25	-	+80	°C	<b>External interfaces:</b> <ul style="list-style-type: none"> <li>• TYCO 'Mate'n'Lock' connector for power</li> <li>• RJ-45 connector for RTCU unit connection.</li> <li>• Mini USB 2 for ActiveSync and USB Host 1.1</li> <li>• USB port</li> <li>• SD-card slot</li> <li>• Earphone jack</li> </ul> NMP software and maps are pre-installed on the delivered SD-card.
Operating temperature	-10	-	+65	°C	
Operating humidity (non-condensing)	10	-	80	%	
Weight	615 (PNM device) 70 (PNM interface box)			g	
External dimensions	W188 x H114 x D35 W 75 x H 27 x D 50			mm	PNM device without interface cable. PNM device interface box.

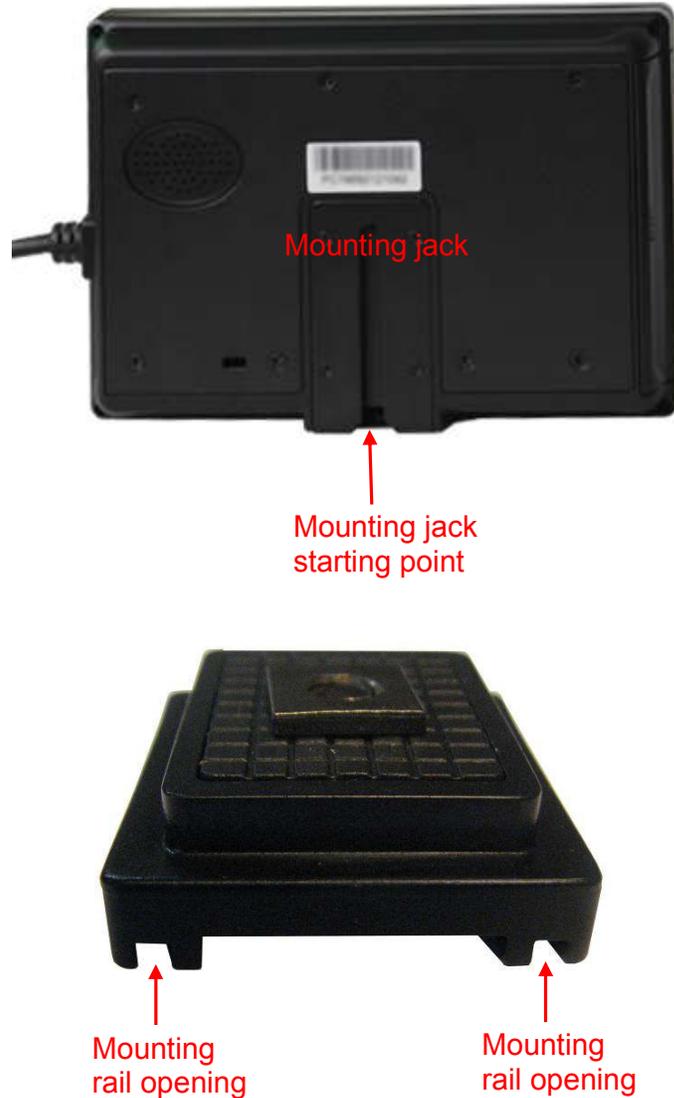
## Appendix A – Mounting the Dashboard Bracket

A dashboard mounting bracket is included for easy installation of the PNM-100 device. In the following mounting of the bracket will be described.

The bracket consists of two parts. One of the parts is will be mounted on the PNM device, and the counter part will be attached to the dashboard. The two parts are illustrated in the following picture:



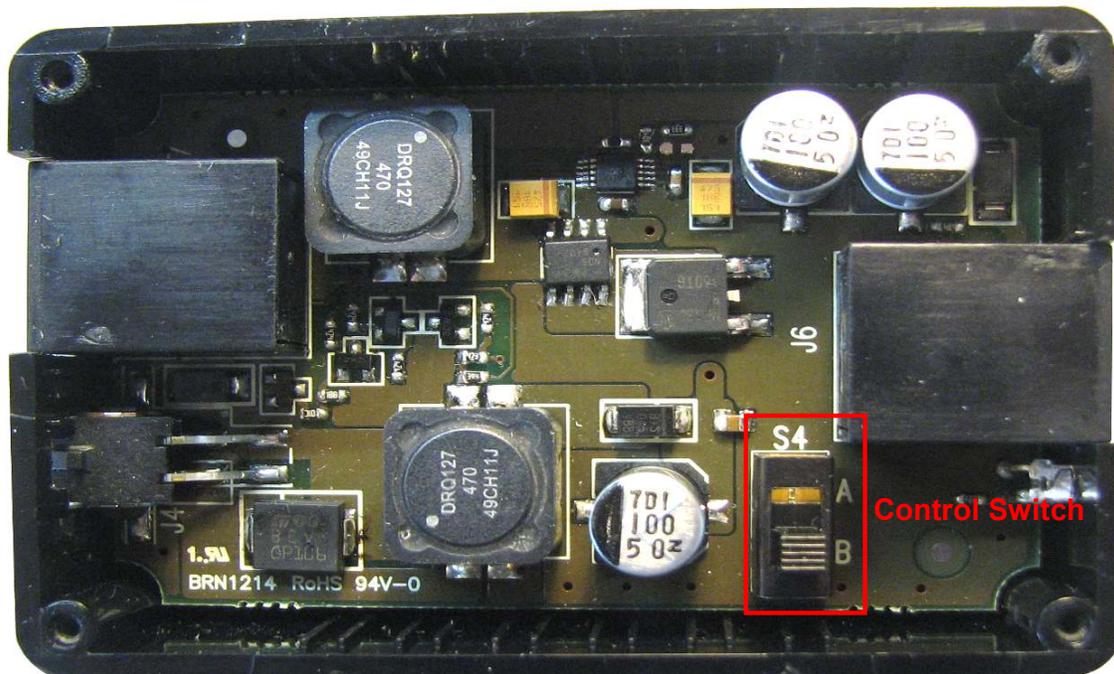
1. The two mounting parts are attached together when delivered. Please release the top part (part 2) by pushing the release handle downwards and then slide it.
2. Remove the protection paper of the adhesive and place the part 1 on a proper location of the dashboard. Please make sure that the bracket is mounted on the correct location with the correct angle.
3. Loosen the screw at the bottom side of the bracket part 2 so there is a gap between the bracket part and the metal plate.
4. Turn the bracket part 2 upside-down; place the part on the starting point of the mounting jack on the back side of the PNM device. Slide the bracket part until it is on the desired position. Fasten the bracket part using the screw on it. Please note the orientation of the bracket part 2. The two rail openings of the bracket must point downwards, or else it won't fit into the bracket part2.



5. Slide the PNM device into the bracket part 1 all the way down until a click sound is heard. The vertical angle and rotation of the PNM device can be adjusted using the screw handle on the bracket part 1.

## Appendix B – Configuration of the PNM Interface Box

A configuration switch is placed in the PNM Interface box for easy configuration. This switch gives the ability of controlling the PNM-100 device either with RTCU MX2i Pro/Pro+, RTCU CX1 Pro/Flex or RTCU SX1 series. The following figure illustrates the location of the configuration switch **S4**:



By default the switch is in position **B**, and configured to run with RTCU MX2i Pro/Pro+ and RTCU CX1 Pro/Flex. For controlling the PNM-100 device with RTCU SX1 series please slide the switch to position **A**.

**Please Note** that when the switch is in position **A** when using RTCU MX2i Pro/Pro+ or RTCU CX1 Pro/Flex the control signal from the RTCU unit is overruled by the PNM Interface box, and the PNM100 device will always be powered on!