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ViAcode PCM

Technical Manual

Version 2 Issue 1



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Introduction



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Safety Considerations

Safety considerations specific to the operation of the PCM (Print Control Module) are provided under the section "Safety Requirements" on page 3. Before installing or operating the PCM read and adhere to all of the safety instructions. Failure to read all safety instructions could lead to death, personnel injury, or damage to equipment.

The following paragraph formats are used throughout this manual to highlight safety issues and risk of damage to the equipment.



Warning

This symbol and text format is used throughout the manual to highlight warnings. A Warning is provided where circumstances could lead to personal injury or death.



Caution

This symbol and text format is used throughout the manual to highlight cautions. A caution is provided in circumstances where damage could occur to the equipment.

The following paragraph format is used throughout this manual to draw the reader to points of interest or notes.



Note

This symbol and text format is used throughout this manual to draw your attention to important information and tips.

Certification

The PCM is certified in accordance with the requirements for CE marking. The equipment complies with the EMC Rules for a Class A (industrial environment) computing device.

Operation of the equipment in a residential area may cause unacceptable interference to radio and TV reception.

Matthews Marking Products disclaims all responsibility regarding the CE directive if the printer is used, altered, or installed in any way other than described in this manual.

About this Manual

This manual contains technical information with regard to safety, installation, and printer settings for the PCM. It is important that all information regarding safety is read and adhered to. It is recommended that the reader begins by reading the section named 'Safety Requirements'

For information regarding the creation of messages, please refer also to the Operator's quick reference guide that is delivered with the PCM.

Technical Support

For technical support within the USA call:

Table 1 - - Technical support details

Time	Telephone number
8:00 AM to 5:00 PM Eastern Time USA-weekdays	1+ 412 665-2500
5:00 PM to 8:00 AM Eastern Time USA-and weekends	1+ 412 365-8324

Safety Requirements



The following safety requirements are **important**. Read and adhere to the safety requirements before installing or operating the PCM. Failure to read the safety requirements can lead to death, personal injury, or damage to the equipment.



Warning

- *The PCM's power-supply-adaptor must be connected to an electrical supply that is fused and can be securely isolated. It is recommended that a GFI (Ground Fault Interrupt) is used.*
- *Do not place the PCM in a location where the power cord is not accessible. There must be access to the power cord at all times. It must be possible to disconnect it in an emergency.*
- *If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.*
- *There are no user serviceable parts for the PCM. Only a properly qualified and trained technician should do any required service.*
- *Safety glasses and solvent resistant gloves should be used when contact with the ink or solvent liquids is possible.*
- *The PCM must be correctly mounted. Make sure that it is securely mounted and there is no risk of it falling.*

Overview



System Setup

The PCM (Print Control Module) is used to configure and control print head installations. It is also used to create, manage, and select messages for print.

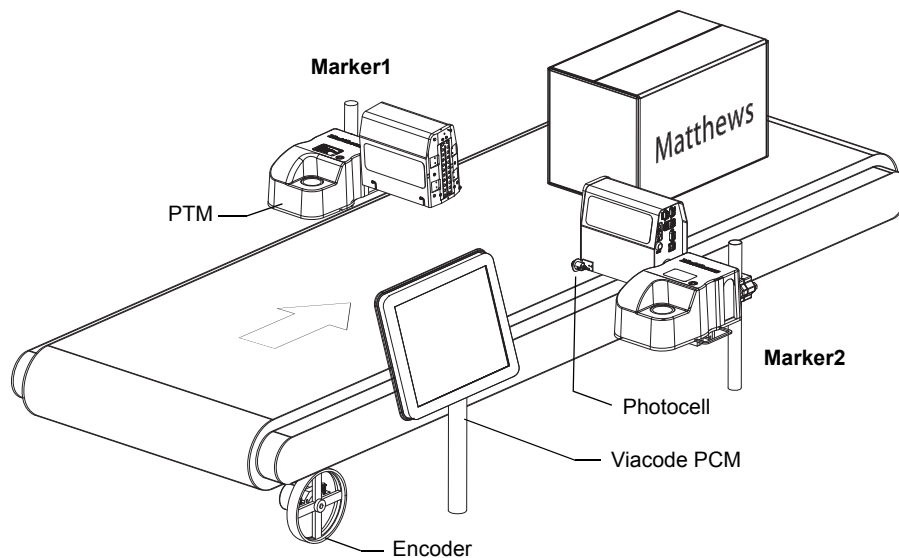


Figure 1 - System overview

Communication with print heads (PTMs) is done using Matthews Ethernet cable. A single PTM can be connected to a PCM either directly or via a Matthews Ethernet switch.

In installations where more than one PTM is installed a Matthews Ethernet switch must be used to connect them to the PCM, as shown below.

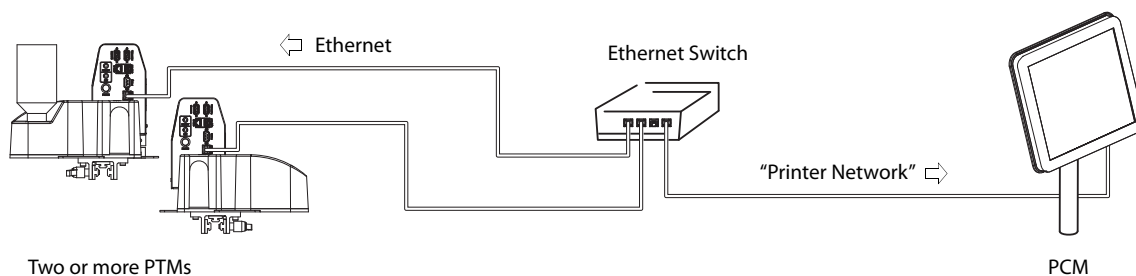


Figure 2 - Connecting more than one print head

PTMs are connected to the RJ-45 connector that is labelled “Printer Network” on the PCM’s interface panel. This network must be used exclusively for Viacode PTMs only. It is a proprietary network.

The RJ-45 connector that is labelled “External Network” is used for remote control of a PCM via existing networks and can not be used for connecting PTMs.

Message creation and editing is done via the PCM's *Editor* menu. For a further explanation about the *Editor* menu refer to "Editor Menu" on page 29.

A typical print system, for a production line, would normally consist of: one or more PTMs, an encoder, and a photocell, as shown in Figure 1.

PTMs, the photocell, and the encoder are sold separately. These can be purchased from Matthews as required. For further information, please contact your local dealer.

Photocell

A photocell is used to detect an approaching print target and signal that a printout should be made.

The photocell must be positioned up-stream of the PTM(s) so that the print target passes it first. The distance between the photocell and the PTM's nozzles must be entered in to the *Installation* settings for the print setup to function correctly. Settings for a photocell are accessed from within the *Configuration* menu, under *Print Heads*.

Speed Encoder

An encoder monitors the speed of the approaching print target and ensures that the PTM's speed of printing is matched to that of the print target. The encoder is normally mounted on the conveyor line where it reads the print target's speed.

The use of an encoder is particularly important in installations where the speed of the production line (print target) is unpredictable. If an encoder is not used and the speed of the production line is inconsistent the printout will be distorted. All settings for an encoder are controlled via the *Configuration* menu, under *Print Heads*.

Print Setup and Installations

The PCM is designed to work with different Print Technology Modules (PTM). A PTM is the actual print head technology used in an installation, such as the T50/T100 or L-Series.

A print setup is called an *Installation* in the PCM. The PCM can manage multiple *Installations*. Each *Installation* can contain one or more *Markers*, which in turn can contain one or more PTMs that make a mark.

In the example shown in Figure 1 there are two *Markers*: Marker1 and Marker2. Each marker contains one print head (PTM) and prints the mark "Matthews" on to the respective side of the box.

If the installation as shown in Figure 1 was named “Matthews MG” it would be displayed in the *Print Head Configuration* window with the structure as shown opposite. This window is accessible from within the *Configuration* menu under *Printer - Print Heads*.

Note that there are two *Installations* shown in Figure 3, the second being named *ZemconMG*.

Matthews MG has its tree structure expanded to show its two *Markers* and respective print heads (PTM). All settings for the *Installation*, the *Markers*, and the PTMs can be viewed and edited on the right-hand-side of the window, as shown.

For further information regarding the configuration of an *Installation* refer to “Configuration” on page 11.

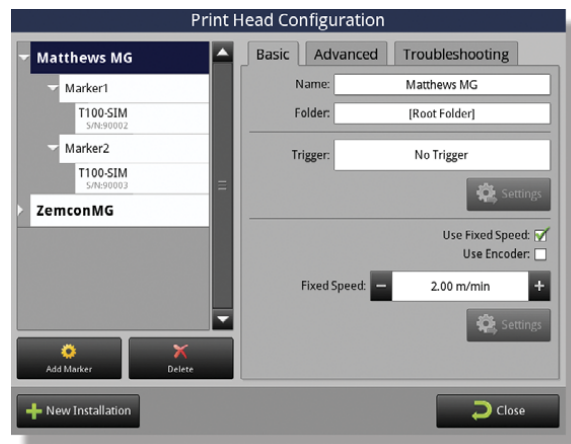
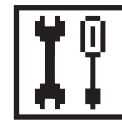


Figure 3 - Example of an installation

PCM Hardware

The PCM hardware can be ordered in different sizes and with different specifications, such as IP classification. Further information regarding the different types of PCM is provided under “PCM Hardware” on page 75.

Installation



A complete installation normally consists of one or more PTMs (Print Technology Module), a photocell, and an encoder. Refer to Figure 1, on page 5. Before connecting or operating a PCM make sure that all PTMs and additional equipment, such as an encoder or photocell, are correctly installed.

Mounting the PCM

All PCMs are VESA (Video Electronics Standards Association) compliant. There are however a number of different specifications, depending on which unit is ordered. For further information refer to “PCM Hardware” on page 75.

Due care and consideration must be given to the mounting of the PCM. It must be mounted so that:

- It is free from vibration.
- It is located in a position where the cables connected to it will not cause obstruction or risk of injury.
- It is free from risk of exposure to: dust, water, or any other fluids.

Matthews Marking recommends mounting the PCM with a VESA arm that utilizes a 75 mm or 100 mm interface pad. Alternatively, a wall mounting bracket that is VESA FDMI (Flat Display Mounting Face) approved can be used.

Connecting the PCM



Caution

Use only Matthews approved cables and switches when connecting PTMs to a PCM. Printing problems can occur if other equipment is used.

PTMs are connected to the PCM using Matthews Ethernet cable. They must be connected to the PCM’s RJ-45 connector that is labelled “Printer Network”. This connection must be used exclusively for connecting PTMs. It is a proprietary Ethernet network.

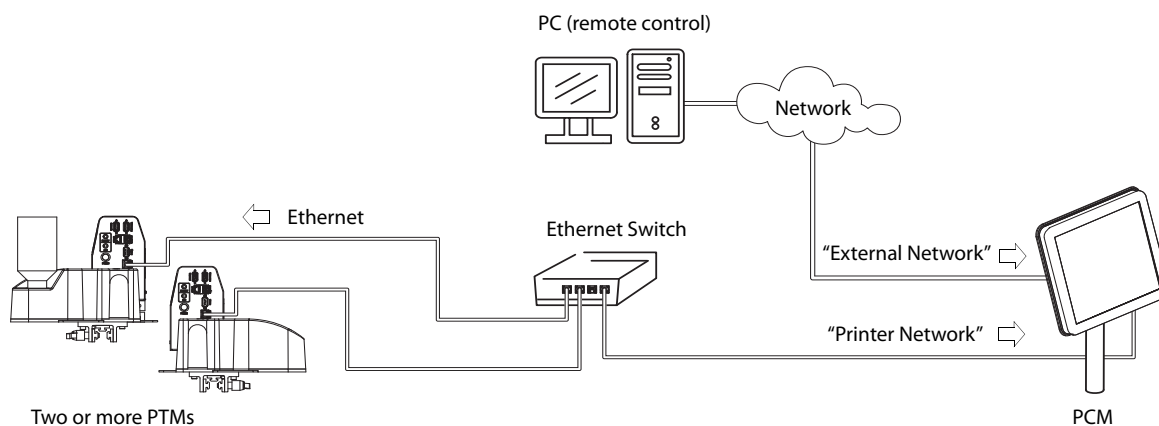


Figure 4 - Network connections

In installations where more than one PTM is used they must be connected to a Matthews Ethernet switch first and then to the PCM, as shown in Figure 4 above.

The maximum length between a single PTM and a PCM, when connected directly, is 100 m, as dictated by the Ethernet standard. The maximum distance between a PCM/PTM and the switch is also 100 m.

The RJ-45 connector that is labelled “External Network” is used to remotely control the PCM over an existing Ethernet network. Do not connect PTMs to it. For further information regarding this functionality refer to “Remote Access” on page 63.

Once PTMs are connected they will be listed in the PCM’s User Interface (UI) when configuring an *Installation*. The user can then select them, as required, to complete the installation process, as described below.

First Start-Up

To start the PCM press the ON/OFF button until the screen starts. The ON/OFF button is located on the interface panel. Refer to “PCM Hardware” on page 75.

Tapping the PCM’s screen will prompt the user for the desired interface language. Once selected, the user can then change or accept the formats for the: keyboard, date, time, and units, as required.

All of these settings can be configured at a later stage, if required. They can be set by selecting them from the *Configuration* menu. Refer to “Configuration Menu” on page 59 for more information.

Once these settings have been changed or accepted the *Initial Print Head Configuration* window will be displayed, as shown.

The user is prompted to either *Create* a print head configuration (*Installation*) or alternatively restore a configuration from a backup stored on a USB device.

When starting the unit for the first time tap the *Create* button to begin the installation’s step-by-step guide. All required devices must be connected for this procedure to fully complete.

If required the user can simply tap the *Cancel* button to exist the installation guide. If cancel is tapped the PCM will exit the installation guide and display the *Overview* menu.

The installation guide can be started at any time, as described below under ‘Configuration’.

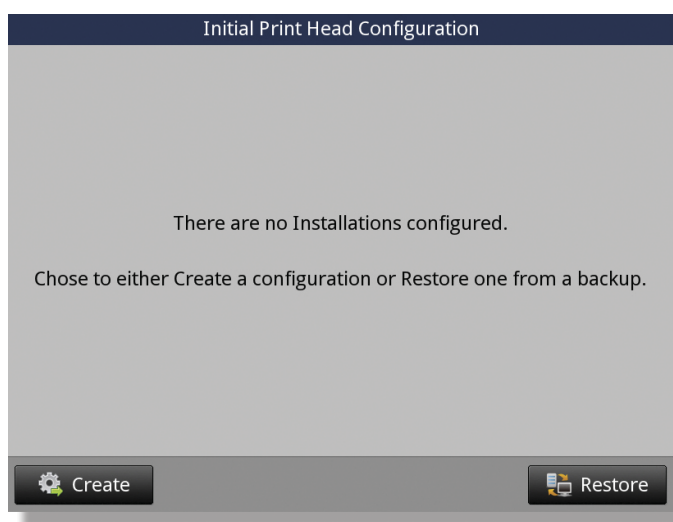


Figure 5 - Initial print head configuration prompt

Configuration

Configuration of a print setup can be started from the *Configuration* menu.

To configure a print setup tap the *Print Heads* button, as shown opposite.

If there are no installations on the PCM, the guided installation wizard will begin, as discussed below. Refer to "*Guided Installation*".

If there are installations on the PCM, the *Print Head Configuration* window is displayed as shown opposite. To initiate a new installation, tap the *New Installation* button, as highlighted.



Figure 6 - Configuring an installation

The user is then prompted to enter information and make selections from lists of detected print heads — PTMs (Print Technology Modules).

The step-by-step procedure for configuring a print setup is listed below. For information regarding specific settings refer to “Settings” on page 16.

Guided Installation

1. Use the displayed keyboard and enter a name for the new *Installation*, then tap the *Next* button.

Note: An Installation is a print head installation. All devices and settings for an installation are managed from within the created Installation.



Figure 7 - Installation name window

2. Select from the displayed list, the PTM that has the required trigger device connected to it. This is the trigger that will be used to activate a printout. Alternatively, select *No trigger*, if print activation is to be initiated by software. Tap *Next* to continue.

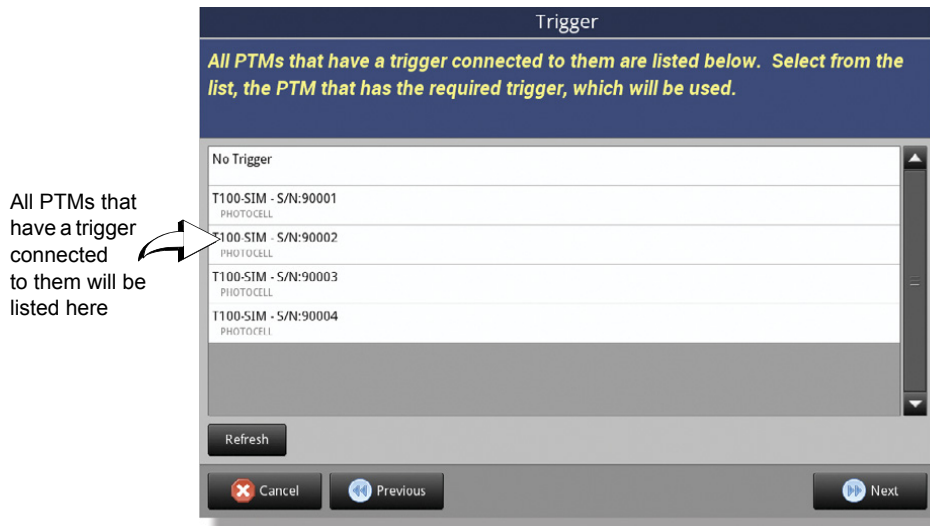


Figure 8 - Print trigger window

3. Select either *Encoder* or *Fixed Speed* from the *Speed Type* window.

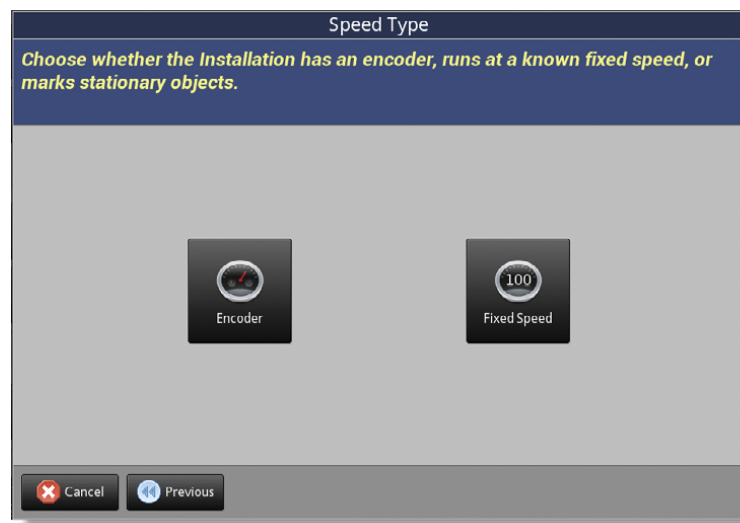


Figure 9 - Print speed options window

If *Fixed Speed* is selected enter the speed of the moving print target in to the displayed keypad and tap *Next*. The entered value must be in either ft/min or m/min depending on the units selected for the PCM.

Note: The speed of the print target must be constant when using the Fixed Speed option, otherwise the printout will be distorted.

If an *Encoder* is used, select the PTM that has the required encoder, from those listed and tap *Next*. Then change/accept the encoder settings, as shown below, and tap *Next*.

Refer to Table 2 on page 16 for a more detailed description of the encoder settings.



Figure 10 - Encoder settings

4. Select the appropriate print head technology to be used, from the displayed *Marker Type* window, and then tap the *Next button*. Either **T-Series** or **L-Series** can be selected.
5. When prompted, enter a name for the first *Marker* to be added to the *Installation*, then tap the *Next button*.

Note: A Marker is one or more print heads that make a print mark. An Installation consists of one or more Markers. Refer to Figure 3, on page 7 for an example of a completed installation.

6. Select the required print direction for the new *Marker* and tap *Next*. Refer to "Markers" on page 18 for a more detailed description of these settings.

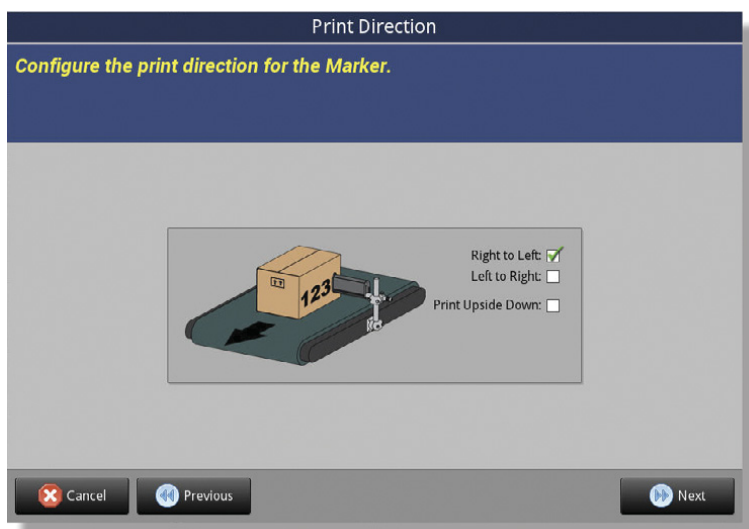


Figure 11 - Print direction window

7. Enter the required *Margin* (inches or mm) in to the displayed keypad when prompted and tap the *Next* button. This is the distance between the front of the print target and the start of the print mark.
8. Select the PTMs that the *Marker* will use from the left-hand-side of the window. If more than one PTM is used (stacked installation) they must be arranged from top to bottom.

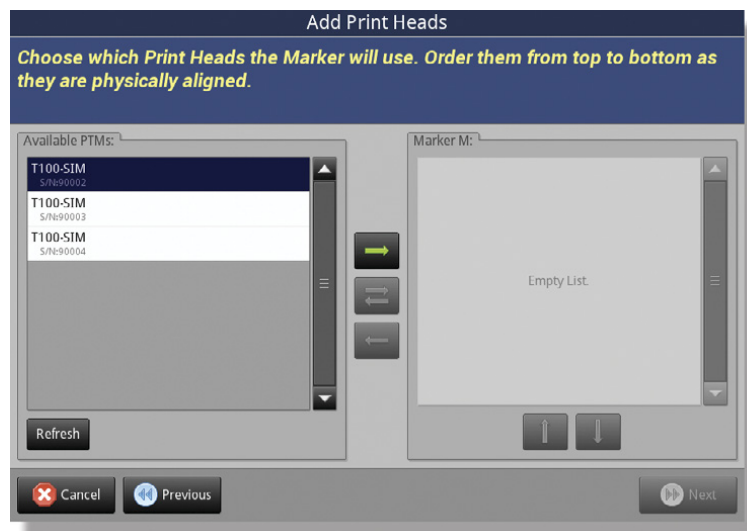


Figure 12 - Add print heads window

Arrange them on the right-hand-side of the window, so that the top most PTM, as they are physically aligned, is first. Use the arrow buttons to move and arrange the PTMs, then tap *Next*.

Note: Use the serial numbers located on the actual print heads to ensure that this is done correctly. The serial numbers on the actual print heads are the same as those listed under each print head in Figure 12.

In the example below the print head marked 1 must be listed first and the print head marked 2 last. If this is not done correctly the top part of the text will be sent to the bottom print head and vice versa – the print mark will be printed wrong.

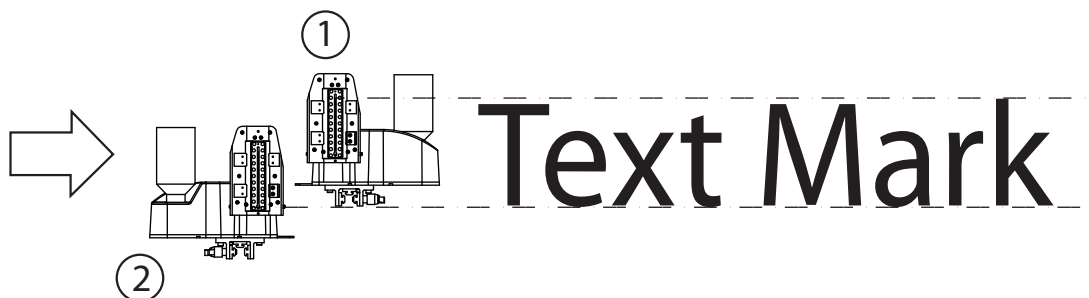


Figure 13 - Selecting print heads for a Marker

9. This step is only applicable if using *L-Series* PTMs. If *T-Series* PTMs are being used go directly to Step 10.

Select the desired *Ink-Cartridge* type from those displayed or the option “*Allow any cartridge*” and tap *Next*.

10. Enter the horizontal distance (inches or mm) from the print trigger to the print head's nozzles and tap *Next*. If more than one print head is used it must be done for each print head.

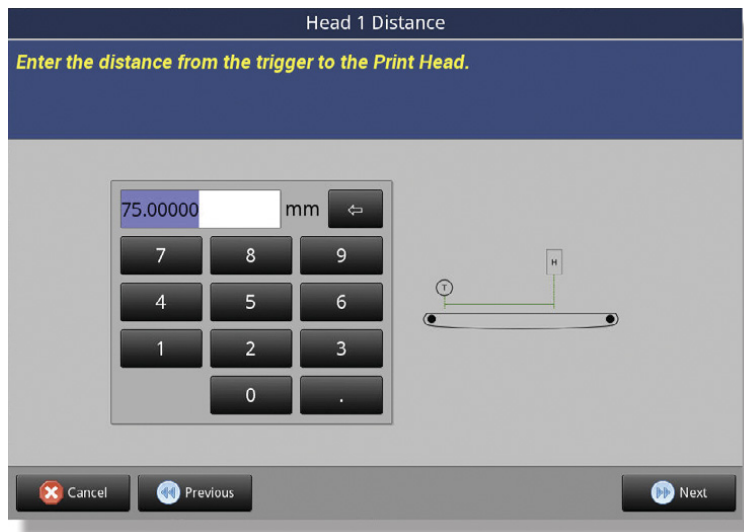


Figure 14 - Trigger distance window

Once complete the guided installation will ask if a new *Marker* is to be created. Select *Yes* to create a new *Marker* for the *Installation*, if required. Otherwise tap *No* and then *Finish* to complete the installation.

Once the installation is completed it will be displayed in the *Print Head Configuration* window, as shown below.

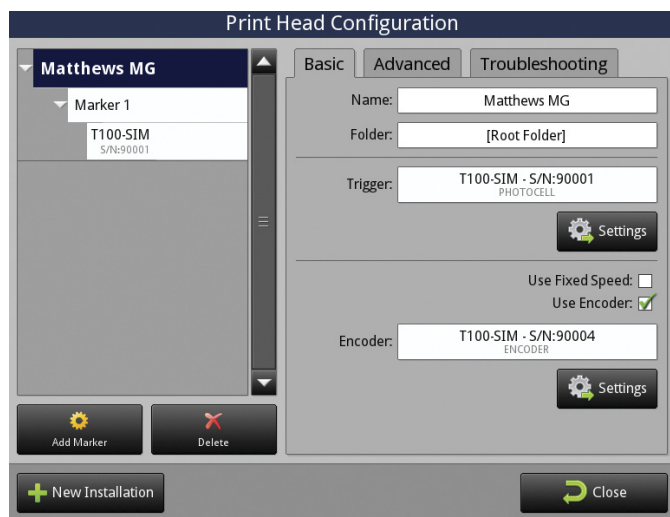


Figure 15 - Print Head Configuration window

Note that the *Installation*, its *Marker*, and the print head are displayed in the tree structure on the left-hand-side of the window. Selecting any of these will display its corresponding settings on the right side. In the above example, the *Basic* settings for the *Installation* are displayed on the right-hand-side of the window. For a detailed description of these settings and more, refer to below.

Settings

Listed below are the settings used to configure a print head setup in the PCM. They are grouped with respect to each of the tree levels in an installation, as shown in Figure 15, on page 15: *Installation*, *Marker*, and *print heads*.

Installation


The settings for an *Installation* are discussed below. Additional settings can be accessed by tapping the setting button  where appropriate.

Table 2 - Installation settings (Sheet 1 of 3)

Installation Settings		Description
Basic Tab	Name	The name of the <i>Installation</i> .
	Folder	The default folder contents that are displayed. The root folder can contain a number of sub folders and any of them can be set as the default folder. Refer to “Messages” on page 49.
	Trigger	Used to select the PTM that has the desired trigger connected to it
	Settings [Trigger]	Debounce Time The setting used to control the trigger’s debouncing. The value entered is the number of ms (0 – 1000) that are required before a new trigger signal is accepted, following a successful trigger. Trigger signals received during the debounce period are ignored.
		Inverted Polarity The trigger’s signal states are switched. The trigger is active until it detects an object, at which point it becomes inactive.
	Use Fixed Speed	Select to use a fixed speed for the speed of printing. Enter the speed of the print target either in ft/min or m/min into the <i>Fixed Speed</i> widget.
	Use Encoder	Select if an encoder is to be used. Select the encoder to be used from those presented.
	Fixed Speed or Encoder	Used to enter the required fixed speed value when the check box option <i>Use Fixed Speed</i> is selected. Or, select the required PTM device that has the desired encoder connected to it, when the check box option <i>Use Encoder</i> is selected.
	Settings [Encoder]	Channel
		Set the signalling option for the PCM. This determines how the PCM will interpret the signals from channel A and channel B of a speed encoder. A – the positive edge of the signal from channel A is used. B – the positive edge of the signal from channel B is used. 2A – both the positive edge and the negative edge of the signal from channel A are used. 2B – both the positive edge and the negative edge of the signal from channel B are used. A + B – the positive edge of the signal from channel A and channel B are used. 2A + 2B – the positive edge and the negative edge of the signals from channel A and channel B are used. Quadrature – the positive edge from channel A and channel B are used to determine the speed and direction of rotation. Quadrature 2x – (Default option) both the positive and negative edges of the signals from channel A and B are used to determine the speed and direction of rotation. Refer to “Speed Encoder’s Channel Setting” on page 84 for a further explanation of these options.

Table 2 - Installation settings (Sheet 2 of 3)

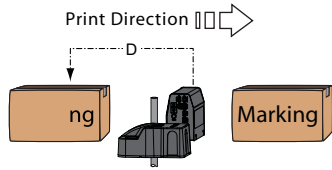
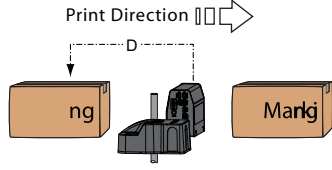
Installation Settings		Description	
Basic Tab	Settings [Encoder]	Direction	<p>The direction of the encoder wheel. This is the direction of the wheel when facing it:</p> <p><i>Normal</i> = a signal is sent whenever the encoder wheel turns clockwise.</p> <p><i>Inverted</i> = a signal is sent whenever the encoder wheel rotates anti-clockwise.</p> <p>Information regarding the direction of the encoder wheel is also displayed under the “Troubleshooting” tab of the <i>Installation’s</i> settings. Refer to Figure 15 - on page 15.</p>
		Auto Detect	Used to automatically detect and set the encoder’s settings. Start the production line and tap the <i>Auto Detect</i> button to configure the settings.
		Pulses Per Meter	<p>This is the number of pulses that the encoder generates per meter. It is calculated as follows:</p> $\text{Pulses Per Meter} = \frac{\text{Resolution of encoder}}{\text{Circumference of encoder wheel (m)}}$ <p>This value must be calculated correctly. It must be calculated with respect to the encoder ppr, the wheel used, and the <i>Channel</i> option. If a Matthews 5 000 ppr encoder and 0.2 m wheel are used, the value 50 000 should be entered.</p> <p>50 000 is derived from the result of $25\,000 \times 2 = 50\,000$. The result must be multiplied by two if the default <i>Channel</i> setting (<i>Quadrature 2x</i>) is used.</p> <p>Refer to “Speed Encoder’s Channel Setting” on page 84 for further examples and calculations.</p>
		Reverse Filter Limit [Advanced settings]	<p>This controls what happens when a print target begins to travel forwards again, following a backwards movement during the printout of a mark.</p> <p>Backwards movement (D) ≤ Reverse Filter Limit</p> <p>If the backwards movement (D), as shown opposite, is less than the value of the <i>Back Limit</i>, printing of the mark’s remaining text will continue at the point at which the backwards movement began — the print mark will look as intended.</p>  <p>This is useful for applications where it is known that the production line may frequently move backwards within a given constraint. Setting the appropriate value for the <i>Back Limit</i> will ensure that the backwards movements do not affect the print marks.</p> <p>Backwards movement (D) > Reverse Filter Limit</p> <p>If the backwards movement (D) is greater than the value of the <i>Back Limit</i>, printing will begin as soon as the target moves forward — the mark’s remaining text will be printed over text that has already been printed.</p>  <p>This is useful in applications where the amount of backwards movement is unpredictable and could be large distances. The user may require that the unfinished mark is completed immediately. They do not have to wait for the backwards distance (D) to be re-travelled.</p>

Table 2 - Installation settings (Sheet 3 of 3)

Installation Settings		Description
Advanced Tab	Minimum Speed Threshold	This is used to control the minimum speed at which the trigger signal is received. For example, if a value of 0.002 m/s was entered, all trigger signals will be ignored if the production line speed falls below this limit. A message will not be printed below 0.002 m/s.
	Message Selection	<p>Set the <i>Installation's</i> message selection option to: <i>Manual</i>, <i>Database</i>, or <i>Fixed</i>.</p> <p>If manual is chosen, the user must manually select each message for print, from those listed in the <i>Select Message to Print</i> window. Refer to "Selecting Messages" on page 24.</p> <p>If <i>Database</i> is chosen, messages will be selected automatically dependent upon the attribute selected in the <i>Database Column</i> setting, listed below. For a more in-depth understanding of this, refer to "Database Messages" on page 71.</p> <p>If <i>Fixed</i> is chosen the user must select a message from the displayed <i>Message Name</i> widget, that will appear when <i>Fixed</i> is chosen. It is not possible to select new messages from the <i>Overview</i> menu — the <i>Select Message</i> button disappears.</p>
	Database Column ^a	Set the database attribute (column) that is referenced for automatic selection of messages. This is only relevant when the <i>Message Selection</i> widget is set to <i>Database</i> .
	Automatic Message Fixation	This ensures that messages are both generated and sent for print to the PTM whenever a trigger is received. If deselected an external protocol must be employed to ensure that messages are generated, typically a device connected to the serial port. These messages are then queued and will be printed whenever a print trigger is received.
	Enable Operator Trigger Button	<p>When enabled, an additional button, as shown opposite, is displayed in the overview menu, next to the <i>Select Message</i> button.</p> <p>This allows the operator to initiate a single printout, immediately, no trigger signal is required. This can be useful for initial print setup/testing purposes.</p> <p>Refer to Figure 18, on page 23, for an example of the <i>Overview</i> menu with the button displayed.</p>
Troubleshooting	Manual Trigger	<p>A print trigger can be activated manually by tapping the <i>Manual Trigger</i> button. Refer to Figure 67, on page 67.</p> <p>Information with regard to the speed encoder used and the trigger is also displayed. This information can be used to help troubleshoot an installation. The information is updated continually.</p> <p>Refer to "Troubleshooting" on page 83 for help with solving print problems.</p>

a. Only visible when *Database* is chosen in the *Message Selection* widget.

Markers

The installation settings for a *Marker*, as shown opposite, are discussed below in Table 3. The settings are divided in to three groups, as shown on the right-hand-side of the screen: *Basic*, *Repeat*, and *Advanced*.

To access these settings first select *Configuration* from the top of the PCM's UI, then tap the *Print Heads* button to open the *corresponding* window, as shown.

Select the required *Marker* from the left of the window to display its settings on the right.

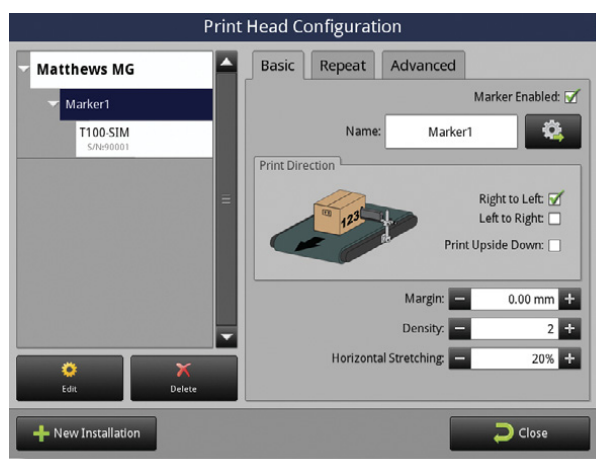


Figure 16 - Editing a Marker

A number of these settings can be overridden from within the *Editor* menu. Tapping the *Message Attributes* button at the bottom of the *Editor's* work grid allows the user to override some of these settings for the selected message.

Table 3 - Marker settings (Sheet 1 of 3)

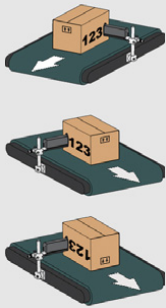
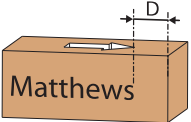
Marker Settings		Description
Basic Tab	Marker Enabled	<p>The selected <i>Marker</i> can be enabled or disabled. The default setting is enabled. If disabled, no printing will occur at that <i>Marker</i>.</p> <p>This allows printing to continue in the event that a fault exists with a <i>Marker</i>, in an <i>Installation</i> which has multiple <i>Markers</i>. Disabling the faulty <i>Marker</i> will allow printing to continue at the other <i>Markers</i>.</p> <p>Markers that are disabled will be displayed in the <i>Overview</i> menu with a red background.</p>
	Name	The name of the <i>Marker</i> .
	Print Direction	<p>Right to Left: If the print target travels from right to left, when standing behind the print head, select the <i>Right to Left</i> option.</p> <p>Left to Right: If the print target travels from left to right, when standing behind the print head, select the option <i>Left to Right</i>.</p> <p>Print Upside Down: Print the text upside down. This can be combined with either of the print direction options.</p> 
	Margin	<p>Adds a margin before the message. The margin "D" (mm) as shown opposite is added before the actual message is printed. The print direction in this example is left to right.</p> 
	Density	<p>The amount of ink used to print each pixel of a message. A higher density will give the message an increasing appearance of black. Increasing the value will also reduce the print head's printing speed.</p> <p>Fractional values are also listed, these significantly reduce the amount of ink used and increase the speed of printing substantially. Fractional values displayed with HS or HQ stand for <i>High Speed</i> and <i>High Quality</i>, respectively. Either ink consumption is reduced with respect to speed or quality of the printout. These options will provide different <i>Maximum Print Speed</i> values.</p>
	Horizontal Stretching	<p>Stretches or compresses the message horizontally. The default value is 100%. Note that this setting applies to the whole message. Images and other objects in the message will also be effected by this setting.</p> <p>Increasing the stretch will also increase the printing speed and vice versa. The increase in printing speed is directly proportional to the percentage increase/decrease in the stretch.</p>
	Intensity <small>Only applicable for L-Series installations</small>	The intensity of the print can be set to either 50% or 100% by tapping the - and + buttons on the widget. This does not affect the speed of printing but does reduce ink consumption.
	Maximum Print Speed <small>Only applicable for L-Series installations</small>	The maximum print speed possible using the current setting for <i>Density</i> .

Table 3 - Marker settings (Sheet 2 of 3)

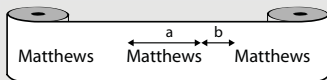
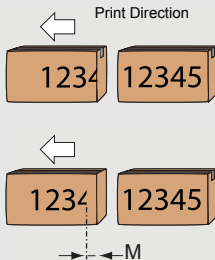
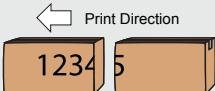
Marker Settings		Description
Repeat Tab	Mark Repeat	<p>The message is printed either continuously or the specified number of times. If <i>Continuous</i> is selected the print mark will be continuously printed.</p>  <p>The start of each repeated mark is separated by the distance (mm) specified as either the <i>Interval</i> or <i>Gap</i>. The difference between these two options is: $Gap = b$, $Interval = a + b$, as shown in the image above.</p> <p>The number of repeated marks (<i>Mark Repeat</i>) can have a value of 1 – 1 000 000.</p> <p>The <i>Update Dynamic Data</i> option allows the user to either enable or disable the updating of objects, such as counters and shift codes, in a message. If it is disabled each printout will be the same — all dynamic objects are made constant.</p>
	Ink Bleeding Compensation	<p>This is used with messages that contain barcodes objects. The ink from the black bars in a barcode may bleed in to the white ones on certain substrates. This can be compensated for by setting a value of 0 – 10, which corresponds to the number of pixels that will be added to the white columns. Some trial and error may be required to establish the required compensation. Should only be used if the readability of barcodes is poor.</p>
Advanced Tab	Terminate	<p>Set the terminate print option to either ON or OFF.</p> <p>Terminate ON: If <i>Terminate</i> is selected the message will terminate printing whenever the trigger is deactivated, as shown opposite. The next trigger activation will result in a new message being printed.</p>  <p>The <i>Margin</i> attribute, which can also be added, is the distance (M) from the end of the print target where termination will take place. Termination of the printout will occur before the end of the target is reached. This ensures that ink is not ejected in to the space between targets.</p> <p>Terminate OFF: If <i>Terminate</i> is not selected the message will continue to print until it is finished, regardless if the end of the print target has been reached, as shown opposite. Ink will be ejected between the boxes.</p>  <p>A new printout will begin at the next trigger activation, once the message has completed printing.</p>
	Automatic Cleaning <small>Only applicable for T-Series Markers</small>	<p>The PTMs for the selected <i>Marker</i> are automatically cleaned as specified using the following inputs:</p> <p>Time Limit: The time period between each cleaning. The print heads will be cleaned every time the entered value elapses.</p> <p>Print Limit: The number of printouts that are produced before the heads are cleaned. The print heads will be cleaned after every count of the entered value. If both options are set, cleaning will occur at the earliest possible time after either of the criteria are met.</p> <p>Cleaning will not occur if the time required to clean a print head is greater than the time between active printouts. A warning will be displayed in the user interface of the PCM if cleaning can not occur.</p> <p>Gutter Cleaning Interval: The number of minutes between each cleaning of the print head's gutter orifice. Ink can seep from the gutter and affect the quality of a print mark. Running the clean process ensures that ink does not seep from the gutter. Recommended setting for gutter cleaning is 20 minutes.</p>

Table 3 - Marker settings (Sheet 3 of 3)

Marker Settings		Description
Advanced Tab	Lexmark <i>Only applicable for L-Series Markers</i>	The type of <i>Ink-Cartridge</i> allowed in a <i>L-Series</i> PTM can be changed. This is initially set when creating a <i>Marker</i> .

Print Heads (PTMs)

The settings for each print head, as shown opposite, are discussed below in Table 4.

To access these settings, first select *Configuration* from the top of the PCM, then tap the *Print Heads* button to open its corresponding window, as shown.

Select the required print head from the left side of the window to display its settings on the right side.

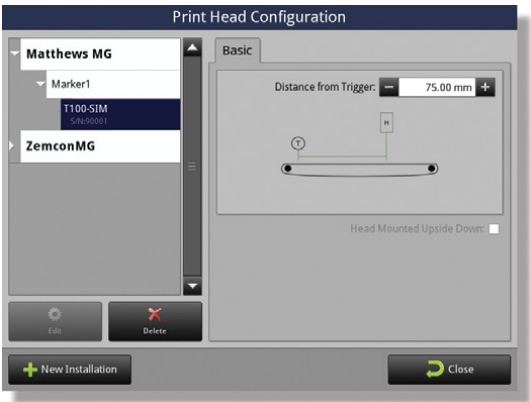
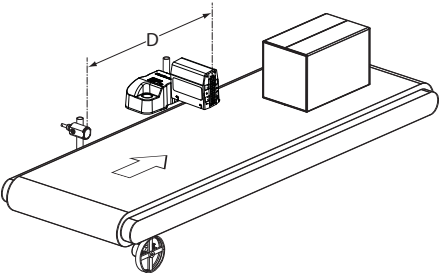


Figure 17 - Editing print heads

Table 4 - Print head settings

Print Head settings		Description
Basic Tab	Distance from Trigger	<p>The distance D (mm), as shown opposite, between the print trigger and the nozzles on the PTM. This setting must be set for each PTM in a <i>Marker</i>.</p> <p>The trigger must be upstream of the PTM. The print target must first pass the trigger and then the PTM.</p> 
	Head Mounted Upside Down	Select if a print head is mounted upside down. Only active for specific PTMs.

Overview Menu



The Overview menu is used for selecting, starting, and stopping the printout of messages. *Installations* that have been configured in the PCM (Print Control Module) are listed on the left. If only one *Installation* exists it is automatically selected and the message preview fills the bottom of the window as shown below.

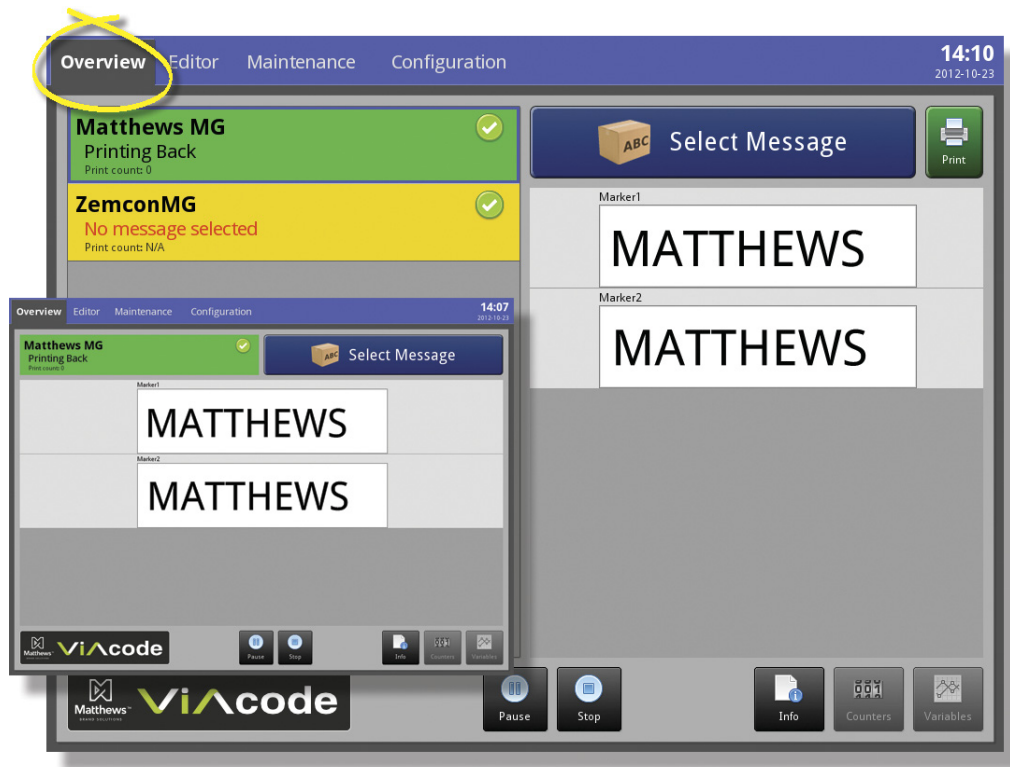


Figure 18 - Overview menu

Installations

The configuration of a print setup in the PCM is called an *Installation*. All installation settings and the devices used for a print setup are assigned to an *Installation*.

An *Installation* is a collection of one or more *Markers*, which in turn consist of one or more PTMs (Print Technology Module) that make a print mark. A typical implementation would be a production line as shown.

In the example opposite there are two *Markers*. One to mark the left side of the box (Marker1), that uses one PTM, and one to mark the right side (Marker2), that also uses one PTM.

In this example both *Markers* are controlled by the same encoder and photocell. When a message is selected for print, it will be printed on both sides of the box.

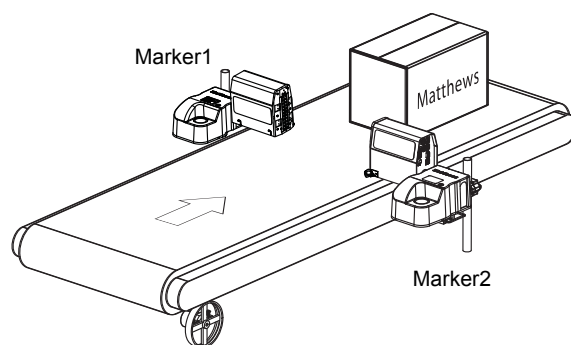


Figure 19 - Installations explained

The PCM can manage numerous *Installations* which are created in the *Configuration* menu. The *Overview* menu only displays a list of the *Installations* and their corresponding *Marker* messages. The *Configuration* menu also list its: *Markers*, *PTMs*, and settings for each of these.

At least one *Installation* must have been created before it is possible to select a message for print. If there are no *Installations* the screen will be displayed blank and the *Select Message* button greyed out.

Selecting Messages


The *Select Message* button is used to select messages for print. If more than one *Installation* exists the desired installation must be selected before it is possible to select a message for it. The PCM needs to know which *Installation* a message is intended for, in this case “Matthews MG”

Tapping the *Select Message* button will display the *Select Message to Print* window, shown opposite. All messages that can be printed are listed on the right. Selecting a message will cause a preview of it to be displayed on the left side of the window.

In the example opposite a preview of the message *Matthews* is displayed on the left. *Marker1* and *Marker2* of the Installation *Matthews MG* will both print the text “Matthews”



Figure 20 - Select message to print window

The *Change Folder* button, highlighted above, allows the user to select messages from a user created folder. For further information refer to “Messages” on page 49. The *Home Folder* button  sets the window to the default root folder.

To print the selected message tap the *OK* button — printing will begin when the PCM receives a trigger signal.

Database Widget

The *Select Message to Print* window will display a database widget, as shown in Figure 20 above, on the bottom left of the window whenever a database message is selected. The widget is used to select which instance (row) of the PCM’s database will be used in the selected message.










The widget is both named and will display the corresponding values in accordance with the *Key Column* (database attribute) that is set in the *Manage Database* window. In the above example the widget is named *Product*, since the *Key Column* has been set to *Product*. Refer to *Key Column* on page 51 for further information.

A database must have been imported and database messages created before this function can be used. More information about this functionality and set up can be found under “Database Messages” on page 71.

Start, Stop, & Pause Printing

The *Start*, *Stop*, and *Pause* buttons are used to control printing of a selected message. The print status of a message is also displayed next to the *Installation*'s name with an icon, as shown in Figure 18, on page 23. The following icons are used to indicate the different print states.

Table 5 - Print status icons

Icon	Description	Icon	Description	Icon	Description
	Printing is active and OK		Print starting		Printing is stopping
	Printing is paused		Print restart delay		Unlicensed PTM
	A fault exists		Printing is stopped		Information is provided in the troubleshooter (warm-up, etc.)

Installations are also colour coded to indicate their printing state. They are coloured green when printing and yellow when either stopped or unable to print, as shown in Figure 18.

If a fault exists they are coloured red. Refer to “Warnings and Troubleshooting” on page 27 for further information regarding warnings.

If more than one *Installation* is configured on the PCM they can all be started or stopped with the *Start/Stop* buttons. First make sure that none of the installations are selected and then tap the appropriate button. A prompt will then be displayed to the user requesting confirmation of the action.

Info

Message information for a selected *Installation* can be viewed by tapping the *Info* button at the bottom of the *Overview* menu. The displayed window, shown opposite, has two tabs: *Print Count* and *Ink Consumption*.

Print Count displays information regarding the total number of printouts. There are two counters, one named *Total print count*, and the other *Print count*.

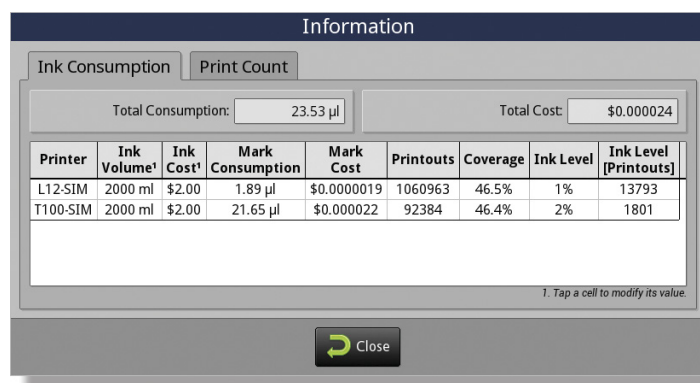


Figure 21 - Message Info window

The *Total Print Count* is the total number of printouts that have been made for a message. *Print count* is only active when a database message is selected and states the number of

printouts for each instance (row) in the database. For example, instance *A* could have a print count of say three and instance *B* a count of five. The *Total print count* for the database message would however be eight. These values are also displayed underneath the *Installations'* names in the *Overview* menu. Refer to Figure 18, on page 23.

The *Ink Consumption* tab displays information regarding ink consumption, cost, and number of possible printouts per ink bottle¹. This information is displayed for each *Marker* and is automatically calculated based on two inputs that the user is required to enter: *Ink Volume* and *Ink Cost*. To enter these values simply tap the respective column, as shown in Figure 21 above, and then enter the input values.

Coverage is also displayed for each *Marker*. This is the percentage of pixels in the message area that are used to make the print mark. If for example, the entire message area was covered with a rectangle that had a 100% fill, the *Coverage* value would be 100%.

Counters

The value of a counter in a message that is currently printing can be reset. Simply select the required *Installation* and then tap the *Counters* button. The *Reset Counters* window will then display the counter's properties.

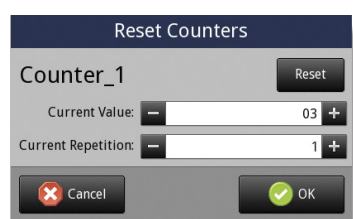


Figure 22 - Reset Counter

Either use the *Reset* button to restart the counter or enter specific values for the *Current value/Current Repetition*. The new values will take immediate effect after tapping the OK button.

This functionality can be disabled so that the operator is prevented from re-setting the counter's values. The option is listed in the counter's attributes window as highlighted below.

It is also possible to set the counter so that the user is prompted to either update or accept the counter's values every time a message containing it is selected for printout.

The counter's attributes can be quickly accessed using the *Message Objects* button in the *Maintenance* menu and then selecting the appropriate counter for editing.

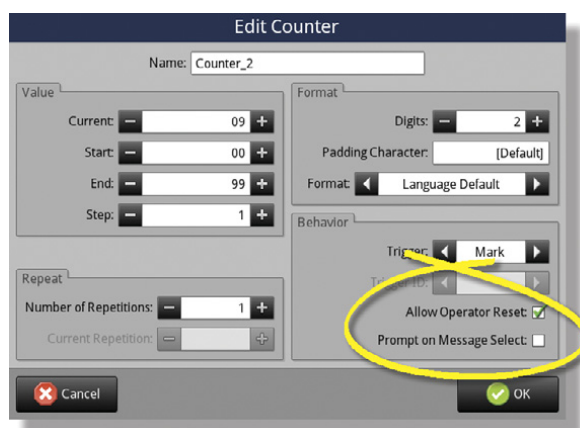


Figure 23 - Counter attributes

Variables

The *Variables* button allows the user to reset a variable in a message, that is currently printing. To reset a variable, simply tap the *Variable* button and then enter the desired value in to the displayed window. The new value will take immediate effect once the *OK* button is tapped. All messages that contain the variable will be

1. The *Total Consumption* and *Total Cost* calculations will take in to account the number of times a mark is repeated.

updated. Similar to counters, this functionality can also be disabled so that the operator is prevented from re-setting its value.

Variables can also be set so that the user is prompted to either update or accept its current value, every time a message containing it, is selected for print. For further information regarding these settings refer to “Variable” on page 33.

Warnings and Troubleshooting

The PCM will display a warning to the user when the ink level is low, empty, or if a fault exists.

Warnings are initially displayed so that the screen is darkened and a large symbol is presented, as shown opposite.

Once the warning window is closed a flashing icon will continue to be displayed on the top of the screen, next to the time and date.


The flashing icon is also displayed next to the respective *Installation*, on the left of the *Overview* menu. The different warning symbols are listed below.



Figure 24 - Warning screen

Table 6 - Warning symbols

Warning Type	Symbol	Warning Type	Symbol
Low ink		Print fault	
Out of ink		Critical Print fault	

A troubleshoot button  Troubleshoot will be displayed underneath the *Select Message* button for *Installations* that have a fault. Tapping the button will display a *Status* window which lists the actual fault(s). The information displayed can be used to help resolve a print fault.

External Warning Beacon

An external warning beacon can be purchased from Matthews. The beacon is connected to a PTM and can be configured to signal whenever a fault/warning is triggered. This is typically used for indicating that a PTM has a low level of ink.

Configuration of the desired signal is done using the *External I/O* functionality that is accessible from within the *Configuration* menu. Refer to “External I/O” on page 68 for further information.

Editor Menu



The *Editor* menu is used to create and edit messages. Message objects such as: counters, date, and time objects can all be created, inserted, and edited from within an actual message.

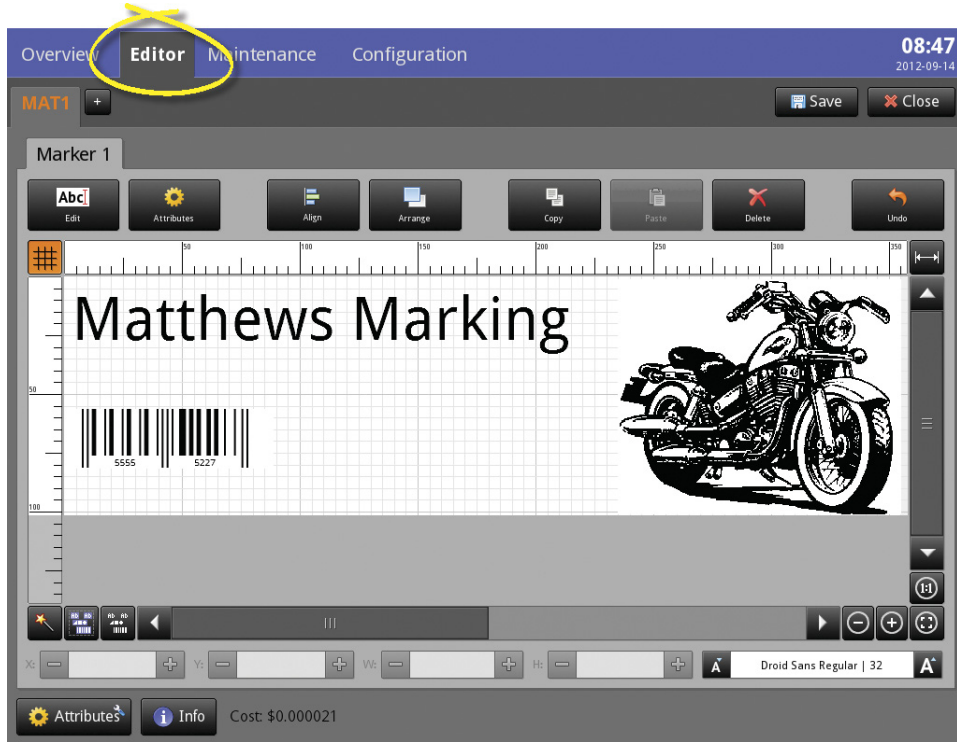


Figure 25 - Editor screen

When the *Editor* tab is first selected the user is presented with three options, as shown opposite: *New*, *Open*, and *Template*.

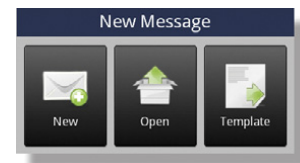


Figure 26 - New message

After tapping one of the options the user will be prompted to select which *Installation* the action is intended for. If there is only one *Installation* on the PCM it will be automatically selected — the user does not need to select it.

If no *Installations* exist it will not be possible to perform any of these actions. Refer to “Configuration Menu” on page 59 for further information about creating an *Installation*.

The *Open* option allows the user to open existing messages for editing. The *Template* option can be used to open a message as a template. The only difference being that the user is prompted for a new name when saving the message, so that the original is not overwritten.

All editing of messages is done using the *Editor*’s interface, as shown in Figure 25 above. Either the touch-screen’s pen or a finger can be used to select and move both message texts and objects within the work grid area.



The *Select Mode* button, located on the bottom left-hand-side of the screen, is used to select the action that occurs when the work grid is touched. There are three options: *Auto*, *Insert*, and *Select*.

Auto. Objects and text on the grid can be selected and moved. The *Object Type* dialogue, shown opposite, pops up whenever an empty area in the message grid is tapped. The *Object Type* dialogue is used to select the type of object the user wishes to insert. Four options are available: *Text*, *Barcode*, *Image*, and *Vector Graphics*, as shown.



Figure 27 - Object type window

Insert. Objects on the grid can not be selected. The *Object Type* dialogue pops up whenever the message grid or an object is tapped — ideal for inserting many objects or objects on top of others.

Select. Numerous objects can be selected and moved. The *Object Type* dialogue does not pop up — ideal for adjusting the layout of a message and its objects, or selecting small objects.

Further information regarding the creation and editing of messages is provided under “Creating and Editing Messages” on page 44. See also the Operator’s quick reference guide delivered with the PCM.

Objects Types and Attributes

Objects can be inserted in to a message by selecting them from the *Object Type* dialogue, as shown above in Figure 27. Each of the object types are discussed below.

Text Objects

The *Text* object type is used to insert text, Unicode characters, and any of the following sub set of dynamic *Text* objects: *Database*, *Variable*, *Counter*, *Date/Time*, and *Shift Code*. The *Plugin* option is used for customer specific system solutions and provides no functionality in the standard version of the software.



Unicode characters are inserted using the U+ button, which is located at the bottom left of the displayed keyboard. It is also possible to change the keyboard layout via the Unicode button. To change the keyboard layout hold the U+ button down until the different options are displayed.

The sub set of dynamic *Text* objects are displayed at the top of the keyboard, as shown. The sub set is grouped under the *Text* object due to the fact that they can all be edited in exactly the same way as a text string.

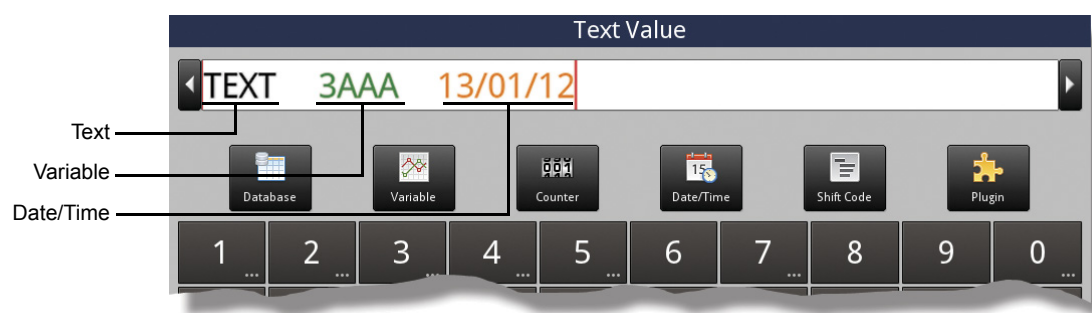


Figure 28 - Text object's window

All of the *Text* objects have the same *Attribute* settings. These settings can be accessed by tapping the *Attributes* button at the top of the *Editor*'s work grid, as shown in Figure 25.

Since all *Text* objects share the same *Attributes* it is possible to combine any of them in a single message text and then edit that text as one object. In the above example a: *Text*, *Variable*, and a *Date/Time* object are all in the same text string.



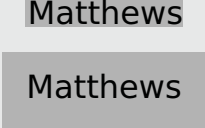
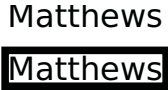

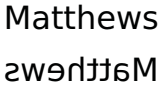
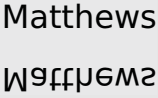
Each *Text* object has its own color which helps the user to easily identify them when creating a string. The whole string can then be inserted in to the *Editor*'s work grid and its attributes changed. The change will apply to the entire string.

Table 7 list the *Text* object's attributes. A description of their function is also provided.

Table 7 - Text object attributes (Sheet 1 of 2)

Text Attributes	Description	Example
Font	Set which font the text will use. Refer to "System Fonts" on page 89 for a full list of available fonts.	--
Color	The text's color can be set as a percentage of black, in multiples of five, within the range 0% – 100%. This can be used to: reduce ink consumption, reduce ink bleeding, or highlight specific texts.	Matthews 50% Matthews 70%
Letter Spacing	Increases or decrease the spacing between the characters of the text. In the second example opposite, the text has had its <i>Letter Spacing</i> increased.	Matthews M a t t h e w s
Line Spacing	Increases or decreases the vertical spacing between lines of text in a paragraph. The second example has its <i>Line Spacing</i> increased. <i>Note: Lines of text are inserted using the carriage return key.</i>	Matthews Matthews Marking Marking
Fixed Width	Enable or disable the <i>Width</i> attribute constraint. Text will be constrained to the value entered (mm) in the <i>Width</i> setting. In the examples opposite the second text has had a fixed width setting of 20 mm applied and the first has none.	Ingredients: Sugar, Glucose, Salt Ingredients: Sugar, Glucose, Salt
Width	The input value (mm) for the <i>Fixed Width</i> constraint. See also <i>Fixed Width</i> above.	--
Alignment	Set the alignment property of the paragraph's text to: <i>Left</i> , <i>Centre</i> , <i>Right</i> , <i>Justified</i> , <i>Squeezed</i> , or <i>Stretched</i> . If either <i>Squeezed</i> or <i>Stretched</i> are selected and the <i>Fixed Width</i> setting is checked, the text will be either squeezed or stretched to the value entered in the <i>Width</i> setting, as shown opposite. The first example has been <i>Stretched</i> and the second <i>Squeezed</i> .	Black Sheep BlackSheep R e a l A l e Real Ale

Table 7 - Text object attributes (Sheet 2 of 2)

Text Attributes	Description	Example
Vertical Text	Make the text string vertical as shown.	M a t t h e w s
Solid Background	<p>The frame that encapsulates the text is made solid — not transparent.</p> <p>In the first example shown opposite, the text "Matthews" is placed on top of a <i>Graphic</i> object and has a solid background.</p> <p>The second example does not have a solid background. It is transparent.</p>	
Fill Color	<p>This option is only available when the option <i>Solid Background</i> is selected. The color is a percentage of black in multiples of five from 0% – 100%.</p> <p>In the two examples shown opposite the first has a solid background and a <i>Fill Color</i> value of 50%, the second has a value of 80%.</p>	
Text Margin	<p>Adds a margin to the text's frame. The first example has a margin of zero. The second example has a margin of twenty.</p> <p><i>Note: the grey area is printed white. Grey is used to simply highlight this example.</i></p>	
Frame Thickness	Set the thickness of the border around the Text frame. The second example has had its frame thickness increased, the first has none.	
Frame Color	<p>This option is only available when the <i>Frame Thickness</i> attribute has a value other than 0.</p> <p>It sets the color of the <i>Frame Thickness</i>. The color is a percentage of black in multiples of five from 0% – 100%. In the example shown opposite the <i>Frame Color</i> is 60%</p>	
Mirrored	Reflect the object vertically, about its centre point.	
Upside Down	Reflect the object horizontally, about its centre.	
Rotation	Rotate the object: 90° clockwise, 90° anti clockwise, or 180°	--

The subset of *Text* objects: *Database*, *Variable*, *Counter*, *Date/Time*, and *Shift Code*, as mentioned above, are discussed below.

Database

Selecting the *Database* object allows the user to insert an attribute of the PCM's imported database. For further information regarding this functionality, refer to "Database Messages" on page 71.

Variable

These are user created objects and can contain a string of data. A *Variable* can be used in numerous messages. Changing its value will result in all messages that contain the *Variable* also changing to reflect the new value.

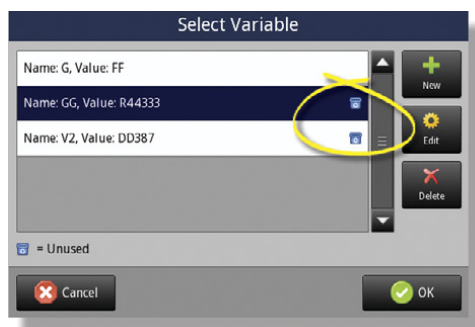


Figure 29 - Select variable

A window displaying a list of existing *Variables* is first presented to the user. Any existing variables, as shown opposite, can be selected for editing and inserted in to a message. Alternatively, a new one can be created.

Only *Variables* that are unused can be deleted. Unused *Variables* have an icon to the right of them, as highlighted opposite. *Variables* that are used in a message can not be deleted. Any attempt to delete such variables is prevented. The *Variable* must be removed from all messages containing it before it is possible to delete it.

There are two additional settings that can be applied to variables, these being: *Allow Operator Reset* and *Prompt on Message Select*. The first option enables or disables the user from re-setting the *Variable* via the *Variables* button in the *Overview* menu. Refer to "Variables" on page 26.

Prompt on Message will result in the user being requested to either update or accept the existing value for the *Variable*, every time a message containing it is selected for print. Either of these settings can be selected by tapping the check box underneath the variable's value, as shown opposite.

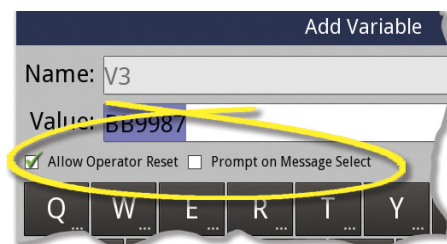


Figure 30 - Variable window

Counter

These are objects that count in relation to a trigger source. Each time a trigger source sends a signal the counter's value is updated ready for the next printout. There are a number of options for the trigger source, it is however normally set to be the end of each printout (Mark), as shown below.

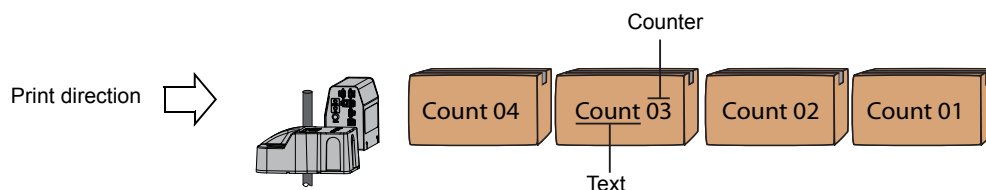


Figure 31 - Counter printout

Tapping the *Counter* button will display a list of any counters that have already been created, similar to that shown in Figure 29 above. New *Counters* can be created by tapping the *New* button.

Only *Counters* that are unused can be deleted. Unused *Counters* have a blue icon to the right of them as shown in Figure 29 above.

Counters that are used in a message can not be deleted. Any attempt to delete such *Counters* is prevented. The counter must be removed from all messages containing it before it is possible to delete it.

The attributes for *Counter* objects are discussed below in Table 8.

Table 8 - Counter objects (Sheet 1 of 2)

Counter Attributes		Description
Value	Name	The name used to identify the counter object.
	Current	The value that will be printed next. Assume a counter counts from 01 to 10 and has reached 07, it can be reset to say 05 using the current value setting. It will then continue to count from 05 to 10. Once 10 is reached the counter will begin from 01 again.
	Start	The initial value of a counter – its first value. The counter then counts to the <i>End</i> value, as specified. Once the <i>End</i> value is reached, the counter will begin from the <i>Start</i> value again.
	End	The end value of a counter. Once the <i>End</i> value is reached the counter will begin from the start value again.
	Step	The <i>Step</i> value is used to set the interval by which a counter is either incremented or decremented. For example, if the <i>Step</i> value is set to two, the counter will increment by two each time a message is printed, as shown below: 0, 2, 4, 6, 8, 10...
Repeat	Number of Repetitions	The number of times a value of a counter is repeated. For example, if a counter is set to count from 01 to 10 and the <i>Number of Repetitions</i> is set to three, the counter will be printed as follows: 01, 01, 01, 02, 02, 02, 03, 03, 03... 10, 10, 10
	Current Repetition	Allows the user to reset the counter to any term in the repeat sequence of a counter (Number of Repetitions). Assume a counter is set so that the <i>Number of Repetitions</i> is four and the counter counts from 01 to 10 as follows: 01, 01, 01, 01, 02, 02, 02, 02, 03, 03, 03, 03...10, 10, 10, 10. If the actual value of the counter is the forth term of 01, the user can reset this to the: 1st, 2nd, or 3rd term of 01. Entering a value of 1 would result in the counter starting from the first term. The printout would continue as follows: 01, 01, 01, 01, 02, 02, 02, 02...10, 10, 10, 10. If the actual value of the counter was the 3rd term of the value 03, and 2 was entered for the <i>Current Repetition</i> , the counter would continue as follows: 03, 03, 03, 04, 04, 04, 04...10, 10, 10, 10.

Table 8 - Counter objects (Sheet 2 of 2)

Counter Attributes		Description
Format	Digits	<p>The number of digits used in a counter. Assume a simple counter has been created that counts from 1 to 10. Two digits would mean that it is displayed as: 01, 02, 03...10.</p> <p>Four digits would cause it to be printed as: 0001, 0002, 0003,...0010.</p>
	Padding Character	<p>The character used for the <i>Digits</i> attribute, as discussed above. For example, if the <i>Padding Character</i> is set to "X" and the <i>Digits</i> value is set to two, the output for a counter that counts from 1 to 10 would be as follows: X1, X2, X3...10.</p> <p>Four digits would cause it to be printed as: XXX1, XXX2, XXX3... XX10.</p>
	Format	<p>The format used to display the counter objects. The default setting is <i>Default</i>, which ensures that the counter objects are displayed in the format of the selected user interface language.</p>
Behaviour	Trigger	<p>Set the action that triggers an update of a counter. There are three options: <i>Manual</i>, <i>Mark</i>, and <i>Counter</i>.</p> <ul style="list-style-type: none"> <i>Manual</i> – the user must update the counter manually <i>Mark</i> – the counter is updated at the end of every print mark (printout) <i>Counter</i> – the update occurs in relation to another counter. The user must set which counter is used to trigger the update (<i>Trigger ID</i>). <p>For example, assume that a counter, count1, has been set to count from 1 to 10.</p> <p>A new counter, count2, can then be set to update in relation to count1. It will update every time count1 completes a full cycle.</p>
	Trigger ID	<p>This is the counter used to trigger an update of another counter. It is used in conjunction with the attribute <i>Trigger</i> as described above.</p>
	Allow Operator Reset	<p>Enables or disables the user from re-setting a counter's value via the <i>Variable</i> button in the <i>Overview</i> menu. Refer to "Variables" on page 26.</p>
	Prompt on Message Select	<p>Selecting this option will result in the user being requested to either update or accept the existing values of a counter, every time a message that contains it, is selected for print.</p>

Date/Time

These are objects that contain information regarding the actual date and time. *Offset* dates can also be created based upon a selected format.

Offset dates are those which are calculated in the future/past, based upon a specified period of time from the actual date. A typical example would be a best-before-date. These are discussed below, but first we will consider date/time objects as shown here.

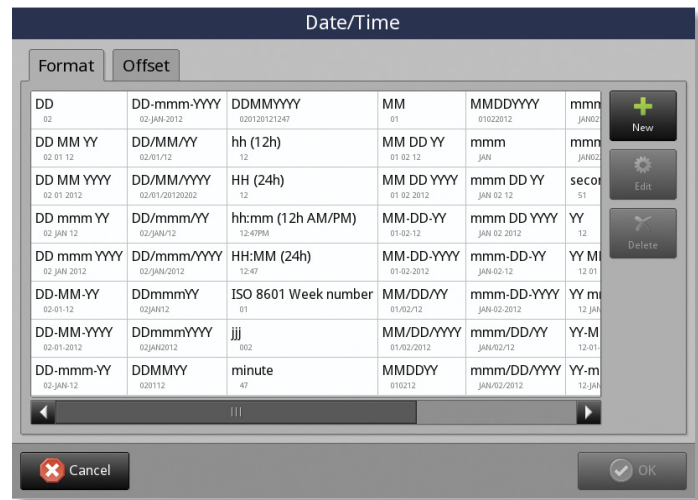


Figure 32 - Date/Time window

A list of pre-formatted date/time objects is first presented to the user, as shown in Figure 32. These can be viewed, edited, and inserted in to a message, as required.

To create or edit a date/time format, simply tap the *Edit* or *New* button to open the *Create Format* window. If creating a new format a name must first be entered for it.

The user can then create the date/time format as required, using the listed format options. The different format options are listed at the top of the *Create Format* window, shown below.

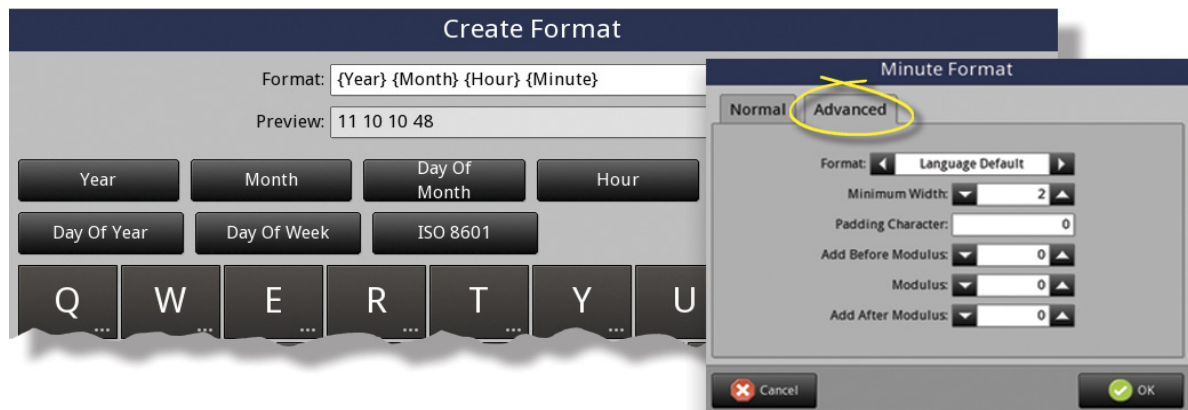
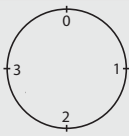


Figure 33 - Creating a custom Date/Time object

These formats have a number of attributes which can be accessed by tapping the *Advanced* tab of the selected format, as highlighted above. Table 9 list the attributes displayed under the *Advanced* tab. An explanation of these attributes is provided.

Table 9 - Date/Time attributes

Date/Time Attributes	Description
Format	The format used to display the <i>Date/Time</i> objects. The default setting is <i>Language Default</i> , which ensures that the <i>Date/Time</i> objects are displayed in the format of the selected user interface language.
Minimum Width	Pad the selected format with the specified number of zeros or other selected character. If the format YY is selected for the <i>Year</i> format and the <i>Minimum Width</i> attribute is set to four, the following result will be displayed: 00YY Any character can be used to pad the format, see below.
Padding Character	Specify the character used for the <i>Minimum Width</i> attribute, as described above.
Add Before Modulus	<p>This is used in conjunction with the attribute <i>Modulus</i>, as listed below.</p> <p>The entered value is added to the actual value of the format, and then the modulus of the result calculated, as specified in the <i>Modulus</i> attribute, such that:</p> $(a+b) \text{ (modulus } n)$ <p>where: a = the actual formats value, B = the <i>Add Before Modulus</i> value.</p> <p>For example, assume that the <i>Modulus</i> attribute for the <i>Seconds</i> format has been set to four, and that the attribute <i>Add Before Modulus</i> is set to one. The following values would be generated</p> <p>Normal values generated: 0, 1, 2, 3, 0, 1, 2, 3, 0.</p> <p><i>Add Before Modulus</i> = 1: 1, 2, 3, 0, 1, 2, 3, 0, 1...</p>
Modulus	<p>Set the arithmetic Modulus on the selected format. For example, if the seconds format had its modulus set to four the seconds would zero at the count of four, as follows:</p> <p>0, 1, 2, 3, 0, 1, 2, 3, 0...</p> <p>Modulus is best understood by considering the modulus clock, as shown. In the example shown the modulus is four and it can be observed that starting from zero and counting clock wise is equal to four. The count always follows the clock cyclic.</p> 
Add After Modulus	<p>This is used in conjunction with the attribute <i>Modulus</i>, as discussed above.</p> <p>The modulus for the selected format is first calculated, as specified in the <i>Modulus</i> attribute. The <i>Add After Modulus</i> value is then added to the result, such that:</p> $a \text{ (modulus } n) + b$ <p>where: a = the actual formats value, B = <i>Add After Modulus</i> value.</p> <p>For example, assume a value of four has been entered for the <i>Modulus</i> attribute and that the <i>Add After Modulus</i> is set to two. The following values would be generated.</p> <p>Normal values generated: 0, 1, 2, 3, 0, 1, 2, 3, 0,....</p> <p><i>Add After Modulus</i> = 2: 2, 3, 4, 5, 2, 3, 4, 5, 2,...</p>

To create an *Offset* date, first select one of the options from the displayed date/time formats, then select the *Offset* tab, as shown opposite.

Tap the *Add* button to display the *Add Offset* window options.

The user can then select one of the *Offset Types*: *Constant*, *Variable*, or *Database*. Each of these is discussed below.

Constant. This simply adds the specified number of *Units* to the actual date/time. In the example shown in Figure 34, one month will be added to the actual date.

This value is constant, it does not change, the specified number of units will always be added to the actual date when the print mark is made.

If *Days* had been selected for the units, one day would be added, instead of a *Month*.

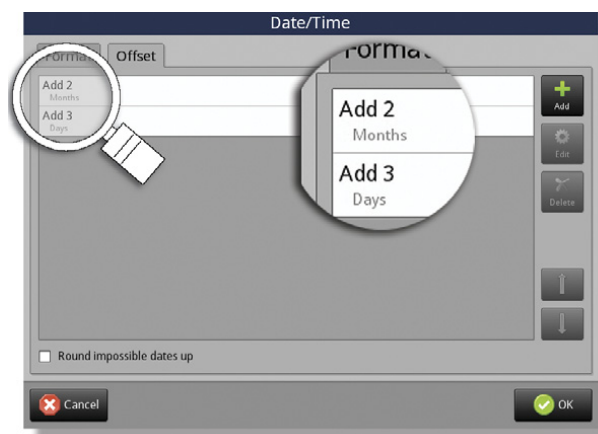


Figure 35 - Multiple Offsets

named “TTT” had been chosen that has a value of three, the specified *Units*, in this example months, would be offset by three. If the variable is updated, the update will also be reflected in the *Offset* object.

The required *Variable* must be created first, before creating the *Offset* date. Once created, check the *Variable* option, as shown in Figure 34, and then select the desired *Variable* from the *Variable* widget. Make sure the *Units* are correctly set.

Database. To fully understand this option, an understanding of the PCM’s database functionality is required. Refer to and read “Database Messages” on page 71 first, if required.

The values stored in an attribute (column) of the PCM’s database are used to set the *Offset*’s value. They will be used to set the *Offset* object for each respective instance (row) of the database.

Assume that the following database is stored in the PCM and that the *Offset* object is to be set using the values listed in the database’s attribute (column) **BestBefore**, as shown below in Figure 36.

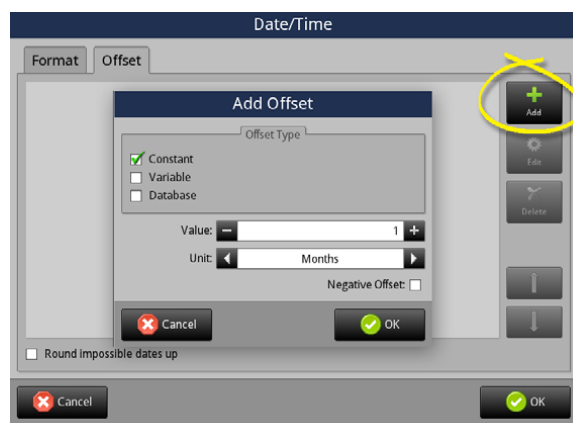


Figure 34 - Add Offset window

More than one *Offset* can be added. For example, one for *Months* and one for *Days* as shown in Figure 35, opposite.

It is also possible to create a negative *Offset*. Instead of adding the units to the date/time object they are subtracted.

This can be set by simply checking the *Negative Offset* check-box at the bottom of the *Add Offset* window, as shown in Figure 34 above.

Variable. The actual date/time is offset by the value that a variable holds. If a *Variable*

The PCM's database can be accessed from the *Maintenance* menu. Refer to “Database” on page 50 for further information regarding the database.

Manage Database				
Product	Origin	Weight	BestBefore	Box Size
Apples	Italy	10 kg	1	LARGE
Bananas	India	20 kg	2	LARGE
Oranges	Marocco	5 kg	5	
Grapes	Spain	1 kg	5	SMALL
Physalis	Columbia	250 g	6	SMALL

BestBefore column will be used to set the offset's value.

Figure 36 - Example database

First, the *Offset Type* needs to be set to *Database* and the attribute (column) **BestBefore** selected. This is done in the *Add Offset* window, as shown in Figure 34 above. The attributes (columns) of the database will be listed instead of the *Value* widget when the *Database* option is checked.

Once the database message that contains the *Offset* date is selected it can be changed to display the information of any instance (row) in the database and hence the adjusted *Offset* date. The displayed *Offset* date is dependent upon the instance's **BestBefore** value.

The desired instance (row) of the database that is to be used in the message can be selected via the database widget, which is located at the bottom of the *Editor's* window, as highlighted opposite.

In the example shown the product named *Apples* has been selected from the database. Changing the database widget to *Bananas*

would change the database message to display the information for *Bananas*. Noticeably, the *Offset* date is adjusted according to the value stored in the **BestBefore** attribute (column) of the database.

Every time a different instance of the database is selected, the PCM will lookup the **BestBefore** value in the respective instance of the database.

The value that is returned is used to set the *Offset Unit*. In the example shown it can be seen that the *Best before* date for *Apples* is one month from the current date. For *Bananas* it is two months from the current date. The values one and two are those listed in the database under the attribute **BestBefore**.

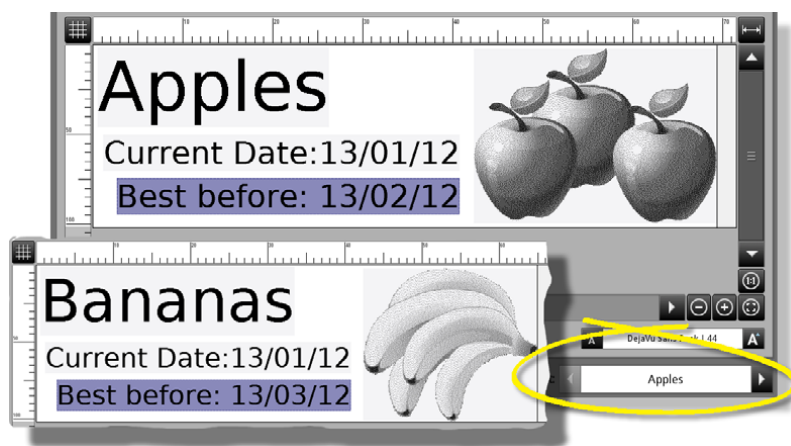


Figure 37 - Offset database message

Shift Code

These can be used to identify which shift was operating when a print mark was made. A 24 hour period can be divided in to a number of shifts (1 – 48). Each shift is then given its own name (code).

Any message that contains the shift code will be automatically updated to reflect which shift is operating when the print mark is made.

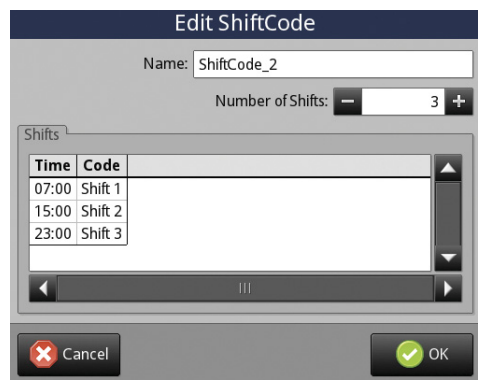


Figure 38 - Shift Code window

If a 24 hour period was divided in to three shifts, named for simplicity: Shift 1, Shift 2, and Shift 3, each would be eight hours long. We will assume that the first shift starts at 07:00, as shown opposite.

Inserting the *Shift Code* object in to a message, as shown in Figure 39 below, will mean that it is printed as “Shift 1” between the hours of 07:00 – 15:00, “Shift 2” between 15:00 – 23:00, and “Shift 3” between 23:00 – 07:00.

In this example simple names have been used for the three shifts, however they can be named (coded) as required.

Selecting the *Shift Code* option will display a list of those already created. These can be edited, deleted, or inserted as required.

Alternatively, a new *Shiftcode* object can be created by tapping the *New* button. A simple wizard will then prompt the user for the required information, as mentioned above.

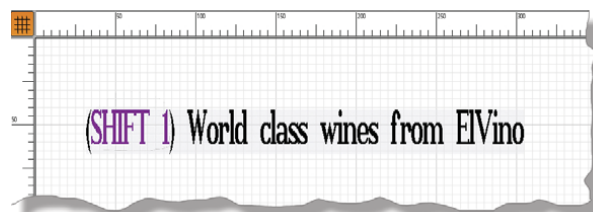


Figure 39 - Message containing a Shift Code

The user is prompted to enter the: number of shifts, start time, and names of the shifts. Once complete the information is displayed as shown in Figure 38 above. Tapping the OK button will insert the shift code in to a message.

Barcode Objects

Selecting the Barcode object allows the user to insert barcodes. The user is first presented with a list of barcode types to choose from. Once a selection is made the relevant data input screen is displayed.



Data must be entered in accordance with the data constraints of the selected barcode type. If an incorrect data format is used a warning is displayed informing the user that it is not valid.

For a detailed description of the barcode objects and their input constraints, refer to “Barcode Objects” on page 85.

Once the data is entered the Barcode Size window will be displayed. This is used to set the height of the barcode object. It can be changed at a later stage if required. Refer to Table 10 below which list this and all other *Barcode* attributes that can be set via the *Attributes* button in the *Editor*.

Note that *Data Matrix* barcodes have a limited set of the attributes listed below.

Table 10 - Barcode object attributes (Sheet 1 of 2)








Barcode Attributes	Description	Example
Human Readable	Write the barcode's code at the bottom of it, in this example 235693. This attribute is enabled by default.	
Quiet Zone	Adds a margin to the beginning and the end of the barcode. The first example has none while the second has a value of twenty. <i>Note: the grey area is printed white. Grey is used to simply highlight this example.</i>	
Horizontal Bearer Bars	Adds a line to the top and the bottom of the code, known as <i>Bearer Bars</i> . The thickness of the lines can be set with the <i>Bearer Bar Width</i> attribute, listed below.	
Vertical Bearer Bars	Adds a solid line to the left and the right of the barcode object. The thickness of the lines can be set as required, using the <i>Bearer Bar Width</i> attribute, listed below. In the example shown opposite the second barcode has a <i>Quiet Zone</i> of twenty and <i>Vertical Bearer Bars</i> .	
Bearer Bar width	Set the value that controls the thickness for <i>Bearer Bars</i> .	--
Font	Select the font type used to display the <i>Human Readable</i> text, as mentioned above.	--
Color	The color black of the <i>Human Readable</i> text underneath the barcode can be changed. It can be set in multiples of five within the range 0% – 100%.	
Letter Spacing	Increases the spacing between the letters of the <i>Human Readable</i> text.	
Width	Increase or decrease the width of the barcode object. Either use the plus and minus buttons to change the size in multiples of 100%. Or alternatively, enter a specific %.	

Table 10 - Barcode object attributes (Sheet 2 of 2)





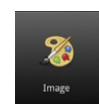
Barcode Attributes	Description	Example
Bar Height	Change the height of the barcode object (mm). The first example opposite has had its <i>Bar Height</i> increased, the second has not. The default value is 19.85 mm. Barcodes heights will automatically be rounded to the nearest possible mm that the print head can print.	
Mirrored	The barcode is reflected vertically, about its centre point.	
Upside Down	The barcode is reflected horizontally, about its centre.	
Rotation	Rotate the object: 90° clockwise, 90° anti clockwise, or 180°	--
Symbol Color	The color black of the barcode can be changed. It can be set in multiples of five within the range 0% – 100%. <i>Note it does not apply to Human Readable text.</i>	
Background Color	Set the color of the barcode's background as a percentage of black in the range 5% – 100%.	

Image Objects

Any of the PCM's images can be inserted in to a message. A list of all Static images is first presented to the user. These can be selected, previewed, and inserted in to a message, as required.



All system images delivered with the PCM are listed in the appendix. Refer to “System Images” on page 91.

Alternatively, an *Image* can be automatically selected using the PCM's database. An understanding of the PCM's database function is required to fully understand the following. Refer to and read “Database Messages” on page 71 first, if required.

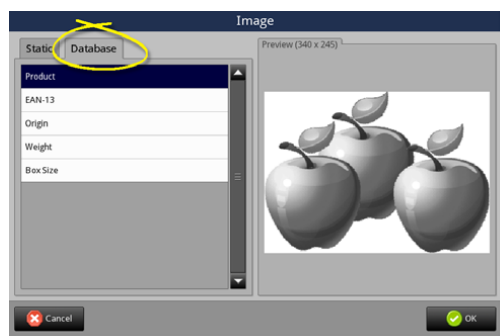


Figure 40 - Database images

Selecting the *Database* tab from the *Image* window, as highlighted opposite, will list all *Attributes (Columns)* of the database on the PCM.

Any of these database columns can be selected to control the image which is used when printing a database message.

If for example, the database attribute (column) named *Product* contains the names of fruits, such as *Apples* and *Bananas*, these could be used to select the desired image when printing the

respective instance (row) in the database message. Refer to Figure 71, on page 71, which list an example of the database.

Firstly, an appropriate image would need to be created for every name in the attribute *Product*. The images must be named exactly as those listed in the attribute *Product*.

Once the images are saved and the database column *Product* selected from the *Image* window, as shown above in Figure 40, the *Editor*'s work grid will be displayed as shown opposite.

In the example shown, the database attribute *Product* has also been inserted for clarity.



Figure 41 - Database image message







The database widget highlighted at the bottom of the window is set to *Apples*, so the PCM searches for the image named *Apples* and inserts it in to the message.

If the database widget was set to *Bananas*, the PCM would search for the image named *Bananas* and insert it in to the message, as shown.

Since there exists an image for each corresponding *Product* in the database, the message editor will display that image for each product automatically.

Table 11 below list the *Image* attributes that can be edited. A description of the attributes is also provided.

Table 11 - Image object attributes

Image Attributes	Description	Example
Mirrored	Reflect the object vertically, about its centre point.	 
Upside Down	Reflect the object horizontally, about its centre.	 
Rotation	Rotate the object: 90° clockwise, 90° anti clockwise, or 180°	--
Negative Print	Invert the image and the frame's colour. The first example shown is not inverted, the second is.	 

Vector Graphics Objects

These are objects that are scalable. They are not bitmap images. There are two types of object that the user can choose to insert: *Rectangle* or *Circle*. Their editable attributes are listed below in Table 12.




Table 12 - Vector Graphic attributes

Vector Graphics Attributes	Description	Example
Width	Change the width of the vector graphic. The second example opposite has had its <i>Width</i> increased.	
Height	Change the height of the <i>Vector Graphic</i> , as shown in the second example opposite.	
Line Width	Set the width of the object's perimeter. The default value is one. The second example, shown opposite, has a width of three.	
Line Color	Set the color of black for the object's perimeter. The color can be set in multiples of five, within the range 0% — 100%.	
Fill	The object is filled with the color black, which can be set as a percentage using the setting <i>Fill Color</i> .	
Fill Color	The percentage of black color that fills the shape. It is given in multiples of five within the range 0% – 100%.	See the attribute <i>Fill</i> above

Creating and Editing Messages

When a new message is created the user must first select which *Installation* it is intended for. If only one *Installation* exists it will be chosen automatically.

The user is then prompted to enter the required length of the message in mm, which is used to set the length of the *Editor's* work grid. Leaving this attribute as zero and tapping the *Next* button will result in the *Editor's* work grid automatically adjusting to the actual message's content.

The message length can be changed at a later stage if required. Tap the  button on the top right of the work grid to change a message's length.

If the selected *Installation* has more than one *Marker* the user will be prompted for the message length attribute for each *Marker* in turn.

In the example opposite an *Installation* named *Matthews MG* has two *Markers*, these being *Marker1* and *Marker2*. Once the values for the message length have been entered the *Editor's* work grid will be displayed, as shown opposite.

Note that two new tabs have been created as highlighted. These being automatically named *Marker1* and *Marker2*.

The creation and editing of each *Marker's* content can then be completed by selecting each tab in turn. All text and objects such as counters, date/time, and barcodes can be inserted and edited as previously discussed under 'Objects Types and Attributes'.

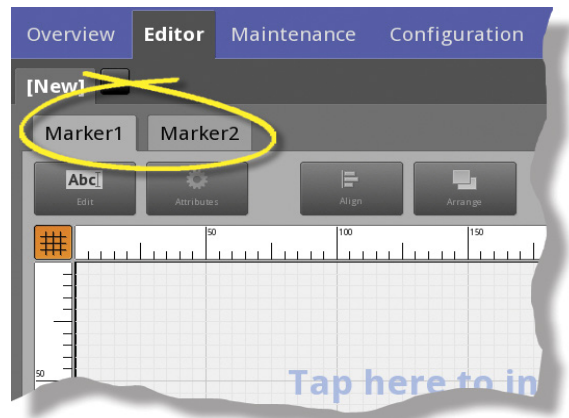


Figure 42 - Matthews MG markers

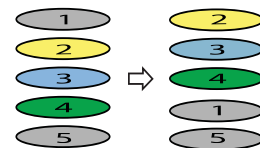
Editing tools

Objects can be edited using the following list of buttons and widgets that are located around the *Editor's* work grid.

Refer also to the Operator's quick reference guide that is delivered with the PCM. This describes basic message creation and editing.

Table 13 - Editor menu tools

Button/Widget	Function
	Edit the selected object's data. If an <i>Image</i> object is selected the image selection window is displayed. If a <i>Text</i> object is selected, the <i>Text Value</i> window is displayed.
	Edit the selected object's attributes such as size and orientation. A full list of the different attributes for each <i>Object</i> type are provided under "Objects Types and Attributes" on page 30.
	Align two or more objects. Select the objects to be aligned and then tap the button to select the required alignment option. When used on a single object the alignment sets the object's anchor point. This is specifically useful when working with images. If a dynamic image is used the user can control in which direction the image will spread, when the image changes.
	Arrange objects in level order. If two objects or more are placed on top of each other the arrange function can be used to order them as required. If a number of objects are simultaneously selected, that reside within other levels, they will retain their order when the arrange function is applied to them. In the example opposite, the yellow(2), blue(3), and green(4) circles would be placed on top if the <i>Bring to Front</i> action was applied to them when simultaneously selected. Noticeably they have retained their order.



Editor Menu – Creating and Editing Messages

Table 13 - Editor menu tools

Button/Widget	Function
	Copy one or more objects. First select the objects to be copied and then tap the button.
	Paste copied objects in to an existing message, between <i>Markers</i> , or in to other messages.
	Delete one or more selected objects. First select the objects and then tap <i>Delete</i> . This action can be undone, as described below.
	Undo the last action: edits, attribute changes, and deletes. Can be used multiple times so that a number of successive undo actions are made.
	Enable or disable the display of the grid lines in the <i>Editor's</i> work grid.
	Set the work grid to 1:1, the default zoom.
	Set the work space to fit the work grid's window.
	Zoom in and zoom out.
	Select the font type used for text. Fonts are selected by tapping the white area of the widget. Increase/decrease a font's size. Fonts are changed using the ends of the widget. These are scaled dynamically if either of the widget ends are held pressed.
	Select all objects on the work grid.
	Un-select all objects on the work grid.
	Adjust the X and the Y coordinates of the selected object. The top left-hand-side of the object is the reference point for the coordinates.
	Adjust the width and height of a barcode object dynamically using the + and - buttons at the ends of the widget. Alternatively, tap the white region and enter a value using the displayed keypad.

Once a message has been edited, it can be saved by tapping the *Save* button on the top right of the *Editor*'s window. The message is saved so that the contents in each *Marker* are saved together. Likewise, when opening the message it will display a tab for each *Marker*, as shown in Figure 42 above. If one of the *Markers* is left blank no printout will occur at that *Marker*.

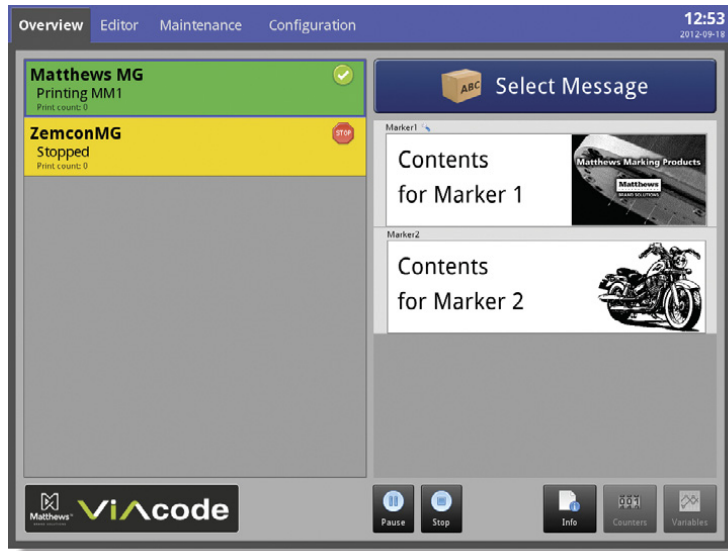


Figure 43 - Overview menu (two markers)

All of the *Markers*' contents are displayed in the *Overview* menu when a message is selected for an *Installation*.

In the example shown opposite, *Matthews MG* has had the message MM1 selected for print.

Whenever *Matthews MG* is selected the *Markers*' contents will be displayed, as shown.

Selecting any other *Installation* will result in the selected message being displayed in a similar fashion.

If only one *Marker* exists, its message will be displayed. If an *Installation* has three *Markers*, then all three messages will be displayed.

Shared Messages

Messages are shared between *Installations* provided they have the same configuration. The *Installations* must have the same number of *Markers* and the same number of print heads for each *Marker*.

To share messages simply ensure that the configurations of the *Installations* are the same and that the name of a *Marker* in each *Installation* is the same, as shown opposite.

In Figure 44 both *Installations* have two *Markers* and each has a marker named *Marker1*.

All messages created for *Matthews MG* will be available for selection when selecting a message for *ZemconMG* and vice versa.

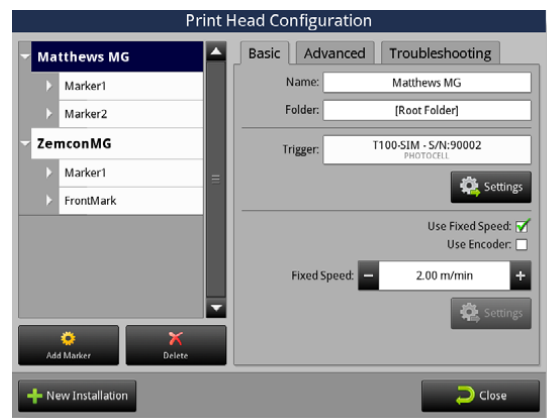


Figure 44 - Shared messages

Message Attribute Overrides

Certain *Marker* settings can be overridden for individual messages. Tapping the *Message Attributes* button at the bottom of the *Editor*'s work grid (see Figure 41, on page 43) will display the *Message Attributes* window as shown below.

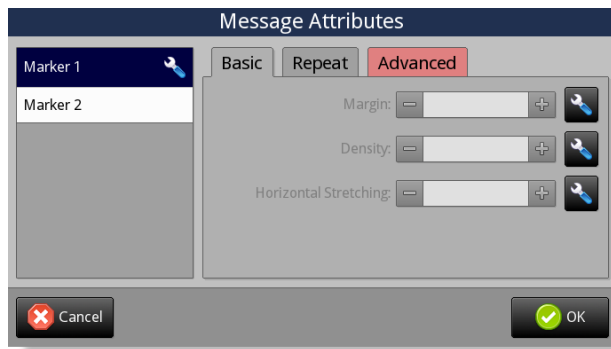



Figure 45 - Message override window

This allows the user to individually override a limited set of the *Marker* settings that are listed in the *Print Head Configuration* window. (Refer to “Markers” on page 18 for a full list and description of the *Marker* settings).

If any of the settings for a message override the *Marker*’s, a spanner icon  is used to indicate this. The icon will appear on both the *Attributes* button, that is located at the bottom of the

Editor window, and on top of the message in the *Overview* menu. It is also displayed in the *Select Message To Print* window.

So as to make it easy to identify which settings are overridden, the relevant tab in the *Message Attributes* window will be colored red. In the above image, overrides have been made for the *Advanced* settings and the tab is therefore colored red.

Maintenance Menu



The *Maintenance* menu is used to maintain print heads and manage stored data. There are three sub menu tabs: *Data*, *System*, and *Printer Maintenance*. Each of these are described in detail below.



Figure 46 - Maintenance menu

Data

All of the PCM's data: *Messages*, *Message Objects*, *Database*, *Images*, *Fonts*, and *Plugins* can be managed as described below.

Messages

A list of all messages stored on the PCM are presented to the user. Selecting a message will display a preview of it on the left-hand-side, as shown opposite.

When first opened the window displays the *Root Folder* contents. This is the top level folder in the system.

Sub-Folders. It is possible to organise messages in to a number of sub-folders, if required. To create new folders the user must first select a message(s) and then tap the *Move* button, which will

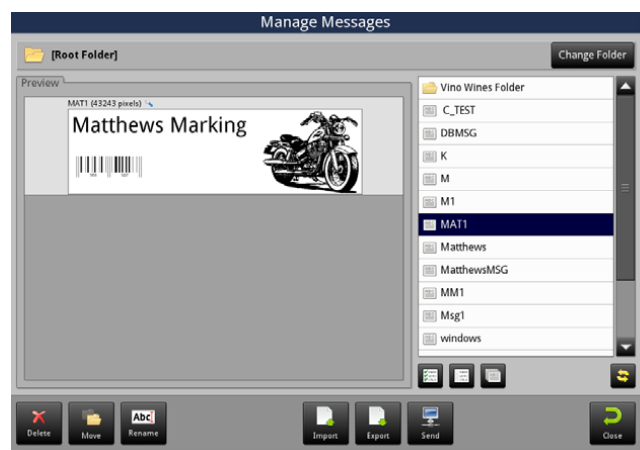


Figure 47 - Manage message window

present the *Choose Folder* window. The user can then either select an existing folder to move the selected messages to, or alternatively tap the *New* button to create a new folder for them.



Note

It is not possible to create an empty sub-folder. Sub-folders can only be created when a message(s) is selected and the Move button is tapped.

To switch between folders, tap the *Change Folder* button, located at the top of the message list, as shown above. The *Change Folder* button is also displayed in the *Select Message To Print* window. Refer to Figure 20, on page 24.

Import/Export/Send. Messages can be imported or exported via the PCM's USB ports that are located on the interface panel. They can also be sent to another PCM that resides on the External network. Simply select the required message(s) and tap the *Send* button. When prompted, enter the IP (Internet Protocol) address of the unit that is to receive the messages and tap OK. A valid IP address must be provided.

The IP address of the receiving unit can be obtained from that unit, under *System Information*, in the *Configuration* menu. Refer to Figure 58, on page 59.

Database

Databases can be imported, exported, and edited. Once a database is imported it can be edited directly from within the *Manage Database* window, as shown below.

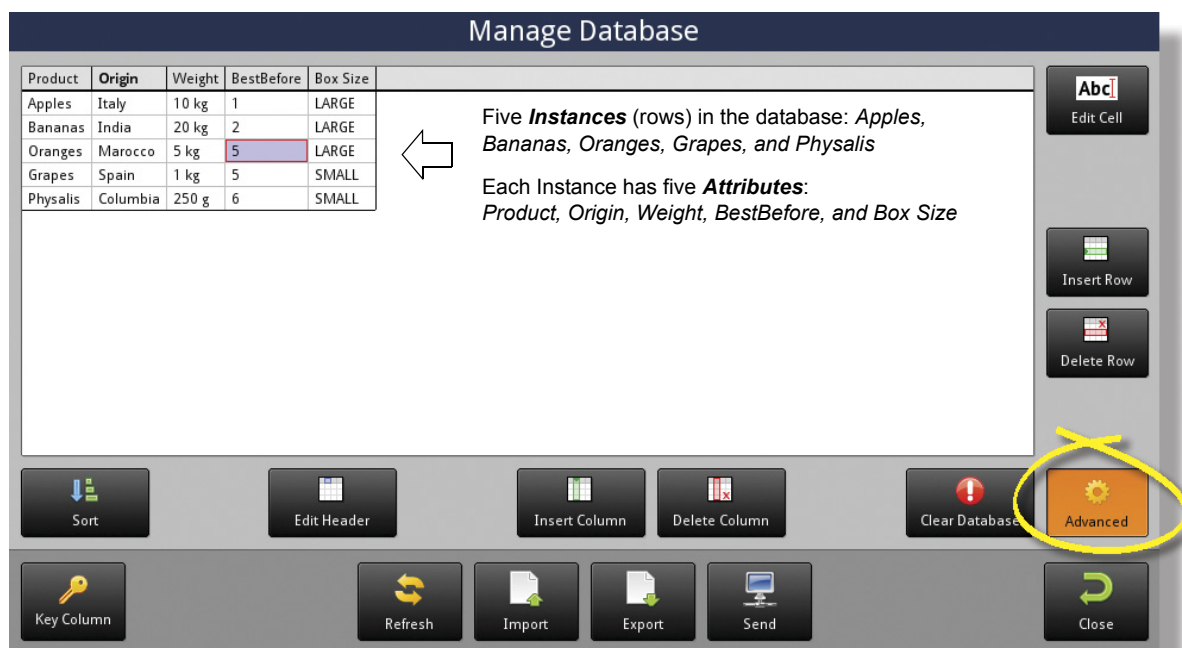


Figure 48 - Manage Database window

The values stored in the cells can be changed. The rows and the columns of the database can be deleted or new ones added. All edits made in the *Manage Database* window are saved to the imported database file.

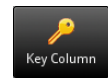
Tapping the *Advanced* button will display a number of additional database functions, as shown in Figure 48.

Import/Export/Send. The user can choose to either *Import* or *Export* a database via one of the USB ports on the PCM's interface panel. Databases must use one of the following separation formats when being imported: comma (,), pipe (|), or tab. The imported file must be of the type: .txt, .csv, or Excel. Exported files are of the format .xls.

The PCM's database can also be sent to another PCM that is on the same network. Simply tap the *Send* button, as shown in Figure 48. When prompted, enter the IP (Internet Protocol) address of the node that is to receive the database and tap OK. A valid IP address must be provided.

The IP address of the receiving unit can be obtained from that unit, under *System Information*, in its *Configuration* menu. Refer to Figure 58, on page 59.

Key Column. The attribute (column) of the database that is displayed in the database widget, is set using the *Key Column* button, as shown opposite and in Figure 48 above.



The database widget is that which is displayed at the bottom of both the *Select Message to Print* window and the *Editor* window, whenever a database message is selected. Refer to “Database Widget” on page 24.

The above database has five *Attributes* (columns). They are: *Product*, *Origin*, *Weight*, *BestBefore*, and *Box Size*. Any of these can be set as the database widget's key. Simply select a value of the desired attribute (column) and then tap the *Key Column* button.

The database widget will be named in accordance with the set *Key Column*, and display its corresponding values. If *Product* is selected the widget will be named *Product* and display the values: *Apples*, *Bananas*, etc.. If *Origin* is selected, the widget will be named *Origin* and display the values: *Italy*, *India*,

Information regarding how database messages are created and configured is provided under “Database Messages” on page 71.

Fonts

Fonts stored on the PCM can be viewed and deleted. Fonts are imported/exported via the USB ports on the PCM's interface panel. Use the *Import* and the *Export* button to perform these actions.

Fonts can also be sent to another PCM on the same network. Simply select the required font(s) and tap the *Send* button. When prompted, enter the IP (Internet Protocol) address of the unit that is to receive the fonts and tap OK. A valid IP address must be provided.

The IP address of the receiving unit can be obtained from that unit, under *System Information*, in the *Configuration* menu. Refer to Figure 58, on page 59.

System fonts delivered with the PCM cannot be deleted and are therefore not displayed. They can be listed by tapping the font widget, located at the bottom of the *Editor*'s work grid. A list of the system fonts is provided in the Appendix. Refer to “System Fonts” on page 89.

Message Objects (counters etc.)

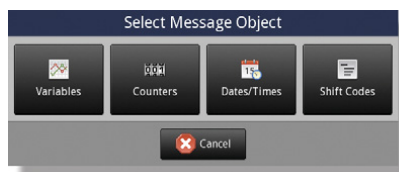


Figure 49 - Message objects

This provides the user with easy access to manage all *Text* objects. *Text* objects that are stored on the PCM can be edited and deleted. It is also possible to create new ones.


Text objects can also be edited via the *Editor* Menu. Tapping the *Text* button from the *Object Type* dialogue window, which is displayed when the work grid is tapped, will allow the user to edit them in a similar manner as described below.

The user must first select which type of *Text* object is to be managed: *Variable*, *Counter*, *Date/Time*, or *Shift Code*, as shown above.

A list of the selected *Text* objects is then displayed. Each of the different *Text* objects are discussed in more detail below.

Variables/Counters/Shift Codes. These objects are displayed in a list form as shown in Figure 50, where they can easily be selected for editing or deletion.

Only objects that are not used in a message can be deleted. It is not possible to delete an object if it exists in one or more messages.

All objects that are unused are displayed with a blue icon  to the right of them.

For further information regarding the different attributes of these objects, refer to “Objects Types and Attributes” on page 30. A full list of each object’s attributes is provided with an explanation of their functions.



Figure 50 - Variable Objects

Date/Time. A list of all *Date/Time* objects stored on the PCM are displayed. These can be previewed, edited, or deleted. It is not possible to delete objects that are used in one or more messages.

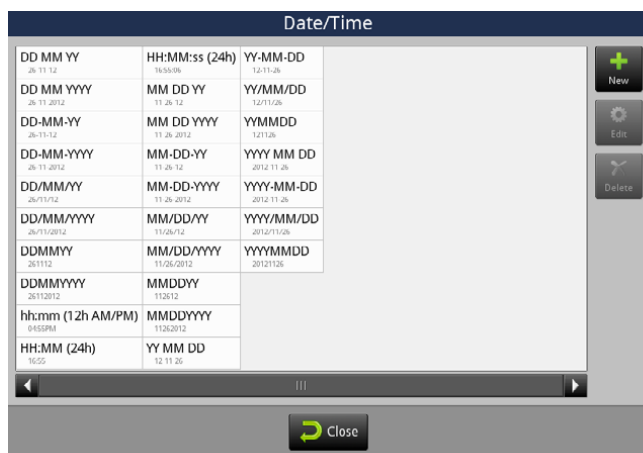


Figure 51 - Date/Time Objects

Custom *Date/Time* objects can also be created. To create a custom object simply tap the *Add* button, as shown. The user is then presented with the *Create Format* window, whereby they can create their own objects, as required. Once created they can be easily accessed along with all other objects, as shown in Figure 51

For further information regarding the creation of custom objects and their options refer to “Date/Time” on page 36.

Images

All images that are stored on the PCM can be viewed, renamed, and deleted.

Images are imported/exported via the PCM's USB ports on its interface panel.

Import/Export/Send. Images that are imported must be of the format .png or .jpeg and use the color format grey scale.

System images delivered with the PCM are listed in the appendix. Refer to “System Images” on page 91 for a full list of these images.

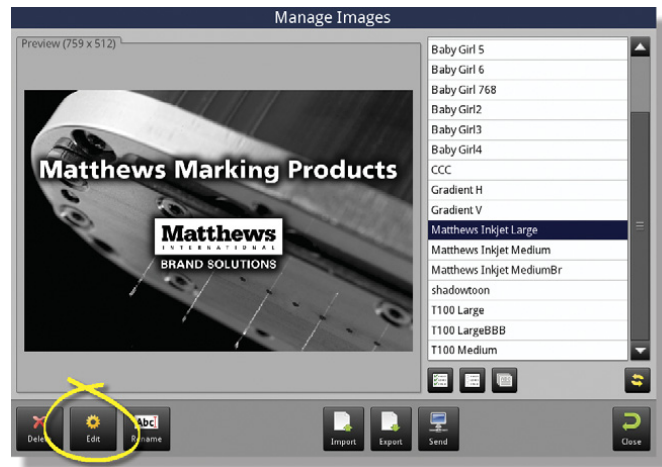


Figure 52 - Manage image window

Images can also be sent to other PCMs on the same network. To send images to another PCM first select them and then tap the *Send* button, as shown above. The user must then enter the IP address of the receiving unit. The IP address of the receiving unit can be obtained from its configuration menu.

Image Editor. The *Edit* button, highlighted in Figure 52, is used to scale images. The existing dimensions (pixels) of an image are displayed at the top of the displayed *Image Editor* window, as shown below.



Figure 53 - Image Editor

New dimensions can be entered below these, either individually or with the *Aspect Ratio* enabled, which ensures that the image is scaled proportionately.

Images can be enlarged or decreased according to an *Interpolation* method if required. This improves the quality of the resultant image.

Simply enlarging an image can degrade the quality of it. Selecting the appropriate *Interpolation* method will help to produce a better quality image.

The *Interpolation* method will add additional pixels to enlarged images automatically, which helps to preserve the image's appearance. Images that are reduced in size are

down-sampled.

The image's brightness can also be adjusted as a percentage in the range -100% – 100%. If a value of 100% is entered the image will appear white, and black if -100% is entered.



Note

Save any changes with a new name! If a value of -100% or 100% is entered and saved, it will not be possible to retrieve the image.

Plugins

This option is for customer specific solutions and does not provide any functionality in the standard version of the software.

A typical implementation would be a filter plugin for barcode objects. The plugin would be used to remove, for example, an attribute of a GS1 barcode, such as the serial number.

The Plugin functionality can of course be used to create many other customer specific solutions. For further information regarding custom requirements please contact your local distributor.

System

The *System* tab provides tools for generating back-ups, troubleshooting reports, and remote shutdown. Each of these are discussed below.

Backup

All data such as: messages, images, objects, and personalized data, are saved with the *Backup* function. Data is saved using one of the USB ports on the interface panel. A USB device must be connected to the PCM before making a backup.

In the event of a crash the PCM can be restored to the state when the back-up was made. To restore the PCM refer to “Restore” on page 62.

Power OFF

This can be used to shut down the PCM both locally or remotely. A Power OFF confirmation is first displayed before shutting down.

Logs

The PCM maintains both a system log and a list of generated diagnostic reports, that can be viewed and deleted as required.

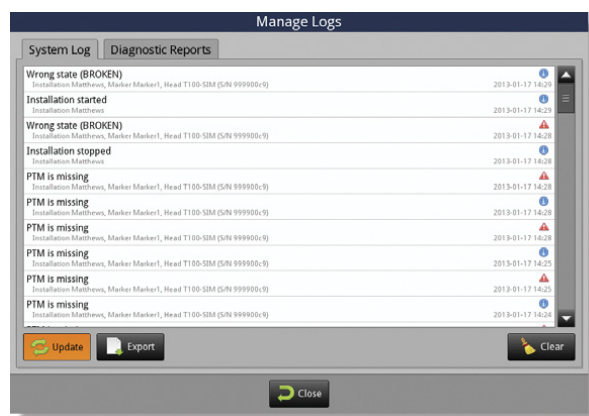


Figure 54 - System log

The *System log* is automatically maintained and can be viewed by selecting the *System log* tab, as shown opposite.

Reports are created by selecting the *Diagnostic Report* tab, and then tapping the *Generate* button.

To generate a report the system must be restarted. A confirmation warning is first presented to the user before shutting down the PCM.

Once the PCM has restarted the report can be viewed, deleted, or exported via the USB

ports on the PCM's interface panel. System logs and reports can be used to both inspect the PCM's historical activity and assist technicians with fault finding. This functionality is intended for technicians only.

Printer Maintenance

Maintenance and print head configuration can be controlled. The options available will depend upon the type of PTM used in an *Installation*.

The *Print Heads* button is used to maintain print heads — cleaning and adjustments can be made.

The *PTM* button is used to configure print heads. Serial numbers and PTMs can be changed/replaced.

Print Heads

The options available depends upon the type of *Marker* selected and its PTMs. As of printing only two types of PTM are supported: the *T-Series* and the *L-Series*.

When a marker is selected the *Clean* tab will be displayed. The options applicable under the *Clean* tab can only be used with a *T-Series* PTM, as described below. These functions can not be used with the *L-Series*.

If a *L-Series* PTM is selected a *Cartridges* tab will be displayed on the right hand side of the window, next to the *Clean* tab. This is discussed below, under *Cartridges*.

Clean



Caution

A T50/T100 PTM must be correctly prepared as described in its Technical Manual before using the Ink Circulation function. Ink can spill on to the floor if a T50/T100 PTM is not correctly prepared.

The user can chose to either clean a *T50/T100* or circulate ink through its ink system.

If an *Installation* is chosen the cleaning function will apply to all *Markers* in that *Installation* and thus all PTMs in those *Markers*.

Likewise, if a *Marker* is chosen all PTMs in that *Marker* will have the function applied to them. If a single PTM within a *Marker* is chosen then the cleaning function applies only to that PTM.

Clean. The *Clean* tab list two options: *Short* clean and *Long Clean*. Both functions take less than a minute to complete. *Short Clean* is intended for cleaning PTMs following a print stop.



Figure 55 - Print head maintenance

Long Clean is intended for cleaning the nozzles. It can be used to help clear debris or old ink from the nozzles.

Ink Circulation. Ink can be circulated through a *T50/T100*. This is normally done for troubleshooting poor print quality or to remove trapped air bubbles in a PTM.

The time required to remove trapped air bubbles is individual for each print head. Typically it would be required that the function is run for twelve hours. The user must enter the number of minutes (1 – 1440) that ink is to be circulated through the system. Circulation of the ink can be stopped at any time by simply tapping the *Stop* button, shown above.

The *T50/T100 Nozzle-Protector-Plate* must be attached to the print head before starting this function. A warning clearly informs the user of this requirement. Ink will spill on to the floor if the *Nozzle-Protector-Plate* it is not used!

Cartridges

Whenever a *L25* or *L25* PTM is selected a *Cartridges* tab will be displayed, as shown in Figure 56 below.

In the example shown there are four *Cartridges* listed under *Horizontal Adjustment* and under *Vertical Adjustment*.

The *L50* has four cartridges and therefore four are listed under the *Cartridges* tab. Likewise, if a *L25* was selected, two cartridges would be listed on the right-hand-side, under each adjustment.

If a *L12* print head is selected the *Cartridges* tab will not be displayed, as it is not relevant — there is only one *Ink-Cartridge* and alignment is not required.

The adjustments made here affect the horizontal and the vertical alignment of the ink cartridges in relation to each other. Adjustments are made to ensure that the printed text is printed correctly. This is normally only required when either installing a print head for the first time or after replacing an *Ink-Cartridge*.

For further information regarding alignment of *Ink-Cartridges* refer to the *L-Series's* Technical Manual.

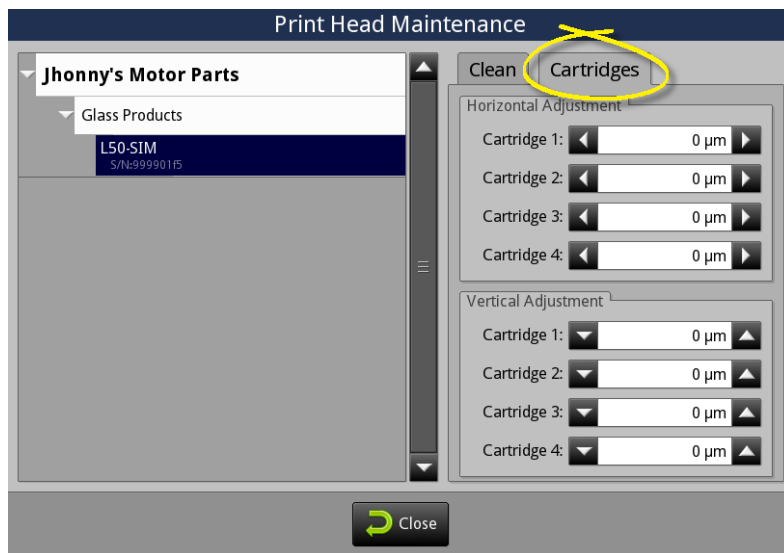


Figure 56 - *L-Series* Cartridge

PTM

Print heads can be replaced and re-named, as shown opposite.

The options available are intended for use by service technicians only. Do not use these settings unless absolutely necessary.

Certain options are PTM specific and are only displayed when the relevant type of PTM is selected. These options are discussed in the respective PTM's Technical Manual, where appropriate.

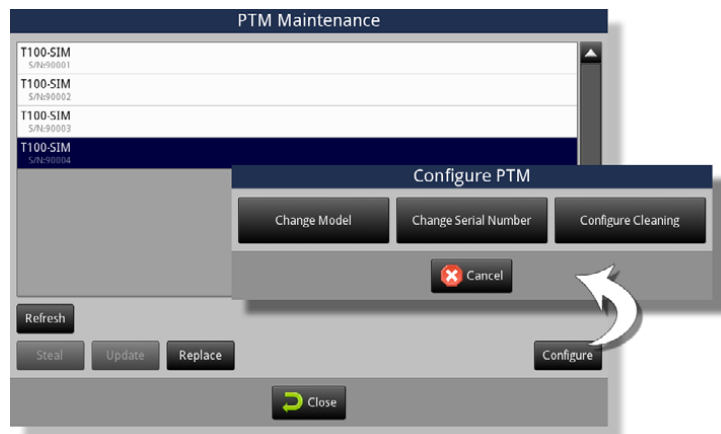


Figure 57 - Configure PTM

Configuration Menu



The *Configuration* menu is used for managing: system settings, remote access, and print head installations. These are grouped under four sub menu tabs: *User Interface*, *System*, *Remote Access*, and *Printer*. The right-hand-side of the window displays a summary of the system information.



Figure 58 - Configuration menu

User Interface

The PCM's user interface (UI) language, local time, and user security level settings can be set with the corresponding buttons: *Language*, *User Levels*, and *Clock*, as described below.

Language

The *Language* options window allows the user to set the: interface language, keyboard layout, date format, time format, and units of measure (Metric or Imperial).

The user interface languages that the PCM supports are listed below in Table 14.

Table 14 - Supported languages (Sheet 1 of 2)

User Interface Language	Displayed Name
Arabic	Arabic (العربية)
Czech	Český (Czech)
Danish	Dansk (Danish)

Table 14 - Supported languages (Sheet 2 of 2)

User Interface Language	Displayed Name
Dutch	Netherlands (Dutch)
English	English
French	Française (French)
German	Deutsch (German)
Hebrew	(Hebrew) עברית
Hungarian	Magyar (Hungarian)
Italian	Italiano (Italian)
Japanese	日本語 (Japanese)
Russian	русский (Russian)
Spanish	Español (Spanish)
Swedish	Svenska (Swedish)
Thai	ภาษาไทย (Thai)
Turkish	Türkçe (Turkish)

The keyboard layout options available are listed below. These are also accessible via the Unicode button (U+) located on the bottom of the *Text* object's input keyboard. Refer to “Text Objects” on page 30.

Table 15 - Keyboard layouts (Sheet 1 of 2)

Keyboard Layouts	Displayed Name
Arabic	العربية (Arabic)
Bulgarian	Българска (Bulgarian)
Czech	Česky (Czech)
Danish	Dansk (Danish)
Dutch	Netherlands (Dutch)
English	English
French	Française (French)
German	Deutsch (German)
Greek	Ελληνικά (Greek)
Hebrew	עברית (Hebrew)
Hungarian	Magyar (Hungarian)
Italian	Italiano (Italian)
Japanese	日本語 (Japanese)
Norwegian	Norske (Norwegian)
Persian	فارسی (Persian)
Polish	Polski (Polish)


Table 15 - Keyboard layouts (Sheet 2 of 2)

Keyboard Layouts	Displayed Name
Romanian	Română (Romanian)
Russian	русский (Russian)
Spanish	Español (Spanish)
Swedish	Svenska (Swedish)
Thai	ภาษาไทย (Thai)
Turkish	Türkçe (Turkish)

User Levels

The level of access to the PCM and its various functions can be controlled with these settings.

There are four types of user: *Full Access*, *Foreman*, *Operator*, and *Locked*, as shown opposite.

Each user type can be configured as desired. Simply select the user type then tap the *Edit* button. The required user rights can then be selected from the displayed list. Functions that a user has privilege to are displayed, as shown opposite, with a green shield. All other functions will be locked. A padlock icon  is displayed on each respective button for functions that are locked.

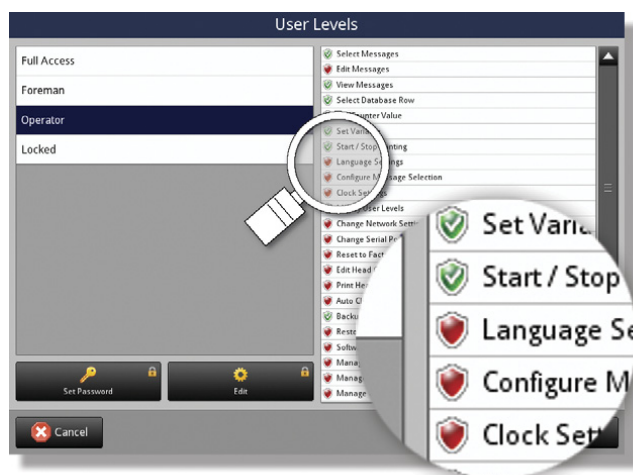


Figure 59 - User level settings

The user settings can be password protected. To protect the different user settings, first select the user type and then tap the *Set Password* button to enter a password. The user will be prompted to enter this password whenever they attempt to switch to that user level. Each user level can have a unique password.

The PCM has a master password which overrides all other passwords and locked functions. The master password is: 1337.

Clock

The date and time settings for the PCM are entered using the *Clock* button. Use the plus and minus buttons, or alternatively click the actual value to open a keypad and enter the desired value. The PCM's time zone can also be set.

System

License details, installed software version, and the restore of data can be managed. Each of these are discussed below.

Software Update

Software updates are done via the printer's USB ports. The USB device must be inserted first, before tapping the button, which will initiate the update.

The user is first prompted to make a backup before the update is started. This can be bypassed if required. The actual software file must then be selected from the USB device.

The software version currently installed can be viewed in the *System Information* tab on the right of the screen, as shown in Figure 58, on page 59.

Restore

The PCM can be restored in the event of a crash. All data previously saved with the *Backup* function will be restored. Simply connect the Backup to one of the PCM's USB ports and tap the *Restore* button. A list of backups on the USB device will then be displayed to the user.

Backups are made using the *Backup* function under the *Maintenance* menu. Refer to "Backup" on page 54.

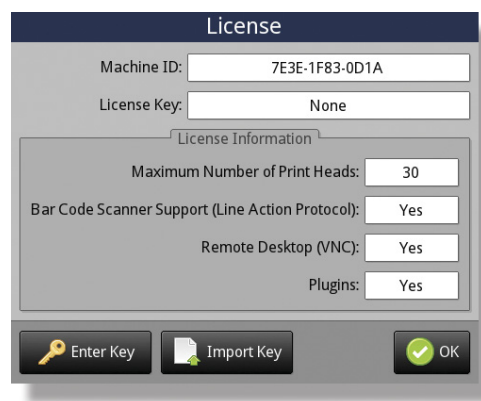
License

A valid license key must be entered in to the PCM before it is possible to operate it with PTMs. Different types of license are available for purchase, which dictate how many PTMs can be operated and whether or not additional functions are enabled. For further information regarding the various license agreements refer to your local Matthews dealer.

The license that was purchased with the PCM is entered during manufacture. However, if an upgrade is purchased the new key must be entered in to the PCM. The *Machine ID*, as shown opposite, will be required when purchasing a new license upgrade.

The key can be entered manually, using the *Enter Key* button or alternatively uploaded from a USB device.

The number of print heads that the license permits is displayed under the *License Information* tab, along with whether or not *Barcode Code Scanner Support (Line Action Protocol)* or *Remote Desktop (VNC)* is included. For further information regarding these functions refer to "Network" on page 63 and "Bar Code Scanner Support" on page 65.



The screenshot shows the 'License' window with the following fields and options:

License	
Machine ID:	7E3E-1F83-0D1A
License Key:	None
License Information	
Maximum Number of Print Heads:	30
Bar Code Scanner Support (Line Action Protocol):	Yes
Remote Desktop (VNC):	Yes
Plugins:	Yes
<input type="button" value="Enter Key"/> <input type="button" value="Import Key"/> <input type="button" value="OK"/>	

Figure 60 - License window

Factory Reset

A *Factory Reset* can be performed if required. Either all settings and data (*Everything*) can be reset to that when the PCM was delivered, or the user can select only specific items to reset, such as counters or messages. A list of these options is first presented to the user before confirming the reset.

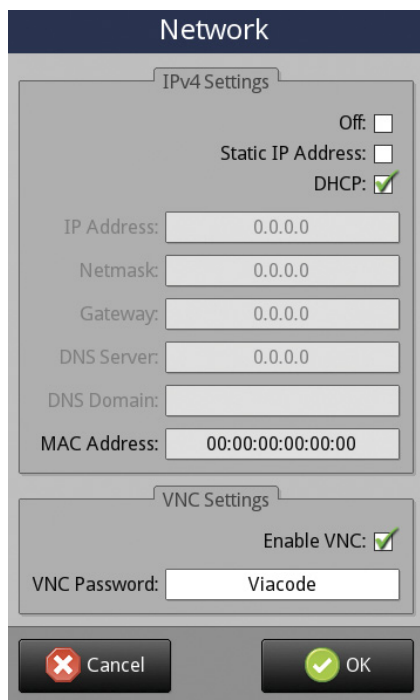
Remote Access

The PCM can be controlled remotely either via a PC (Personal Computer) over its Ethernet channel, or a simple command line interface over its serial port.

It is also possible to configure protocol/communication settings for an external device, such as a barcode scanner. Barcodes are normally read from an approaching print target. This information can then be used to: select a message for print, set the value of a variable in the PCM, or select a database instance (row) from the PCM's database. Further information regarding this functionality is described below as well as the various communication settings and options available.

Network

The *Network* options window allows the user to configure the IP address details of the PCM so that it can be operated remotely over an Ethernet network using a PC (personal Computer).



The screenshot shows a 'Network' configuration window. It has two main sections: 'IPv4 Settings' and 'VNC Settings'. In the 'IPv4 Settings' section, there are checkboxes for 'Off' (unchecked), 'Static IP Address' (unchecked), and 'DHCP' (checked). Below these are input fields for 'IP Address' (0.0.0.0), 'Netmask' (0.0.0.0), 'Gateway' (0.0.0.0), 'DNS Server' (0.0.0.0), 'DNS Domain' (empty), and 'MAC Address' (00:00:00:00:00:00). The 'VNC Settings' section has an 'Enable VNC' checkbox (checked) and a 'VNC Password' field containing the text 'Viacode'. At the bottom are 'Cancel' and 'OK' buttons.

Figure 61 - IP address details

The PCM's license must include this functionality in order to be able to use it. Information regarding the license agreement can be found under "License" on page 62.

To connect a PCM on to an external network use the RJ-45 connection that is labelled "*External Network*", on its interface panel. Do not use the connection that is labelled "*Printer Network*". This is for use with PTM devices only.

Refer to "PCM Hardware" on page 75 for an overview of the different types of PCM hardware and their RJ-45 connection points.

The IP address details of the remote PCM can be set to either *Static* or *DHCP*. If *Static* is selected the IP details must be entered manually. If *DHCP* is selected the IP address is assigned automatically as dictated by the *DHCP* protocol.

The IP address details, once assigned, will be displayed under the *System Information* tab on the right of the

Configuration window, as shown in Figure 58, on page 59.

VNC (Virtual Network Computing) software must be installed on the PC in order to control the PCM remotely. VNC Open Source Software can be obtained from the internet free of charge.

To begin a remote session simply enter the IP address details of the remote PCM in to the VNC software. Once accepted, the PCM's user interface will be displayed in a window on the PC. The PCM can then be controlled on the PC as normal.

A password can be entered to restrict access to the remote PCM. The password is entered in to the *VNC Password* widget as shown above. If enabled, the user will be prompted for the password when connecting to the PCM.

Protocols

The communication settings and options for the PCM's: serial, USB, and TCP/IP ports can be configured from the *Protocol Configuration* window, as shown in Figure 62.

When the *Protocol Configuration* window is first opened it will list all serial ports and USB ports on the left-hand-side, as shown.

TCP/IP ports are created by tapping the *Add* button, highlighted opposite.

To configure a specific port, first select it, and then set its options on the right-hand-side, as appropriate.

Table 16 lists the settings that can be configured. A brief description of each setting is provided.

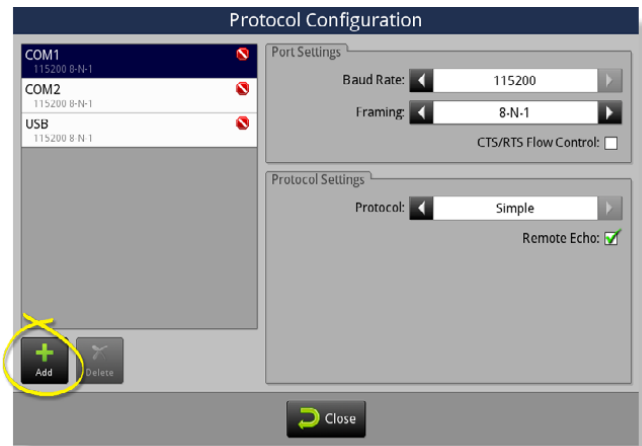


Figure 62 - Protocol Configuration

Table 16 - Serial port configuration

Setting		Description
Port Settings	Baud Rate	The speed of communication (Baud Rate) over the serial port. The following options are available: 1200, 4800, 9600, 19200, 115200.
	Framing	Sets the framing configuration for the serial communication. There are four options: 7-N-1, 7-N-2, 8-N-1, 8-N-2
	CTS/RTS Flow control	Enable or disable the flow control protocol CTS/RTS.
Protocol Settings	Protocol	Set the type of protocol used, as follows: <ul style="list-style-type: none"> <i>None</i> – no communication at all. <i>Line Action</i> – select for communication with an external device, typically a barcode scanner. Refer to “Bar Code Scanner Support” on page 65 for further information. <i>Plugin</i> – used for customer specific solutions only. Refer to “Plugins” on page 54. <i>Simple</i> – select for simple command line communication, such as ASCII. <i>Printer Driver^a</i> – messages or labels that have been created in a Windows application can be sent directly to a PCM. This is ideal for labelling software such as CODESOFT 10. For further information contact your Matthews distributor. <i>XML^a</i> – used to control a PCM remotely using the Viacode XML Specification. For further information contact your Matthews distributor.
	Remote Echo <i>Only applicable when either Line Action or Simple is selected as the protocol option</i>	This setting is only applicable when the <i>Protocol</i> options <i>Simple</i> or <i>Line Action</i> are selected. The setting is checked by default when <i>Simple</i> is selected. To disable it, deselect it. <i>Remote Echo</i> means that the characters sent to a remote device are echoed back to the PCM.

a. These options are only available for TCP/IP ports, that are created using the *Add* button.

Bar Code Scanner Support

The *Protocol* option *Line Action* as listed above in Table 16 must be enabled on the desired port before it is possible to configure the PCM to work with a bar code scanner.

A bar code scanner is connected to either a serial port or a USB port on the PCM. It is then typically used to read a barcode on an approaching print target.

The information read from a barcode can be used to: set the value of a variable in the PCM, select an instance (row) from the PCM's database, or select a message for printing.

Once the option *Line Action* has been selected the *Add* and the *Delete* buttons will be displayed, as highlighted in Figure 63 below.

The *Add* button allows the user to create a new action *Type*, namely:

- Set variable
- Set Database Row
- Select Message
- Plugin

Each of these options are discussed below.

Set Variable. The barcode information on an approaching print target will be read and then used to set the value of a variable in the PCM.

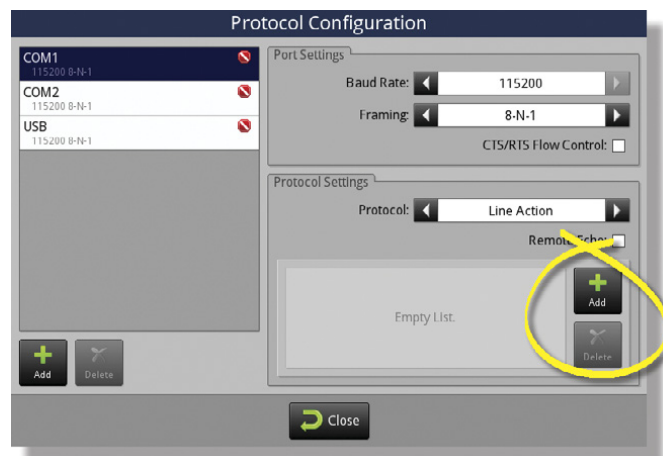


Figure 63 - Line actions

To configure this option, first create a variable as required, then set the *Protocol* option to *Line Action*. Refer to Table 16 on page 64.

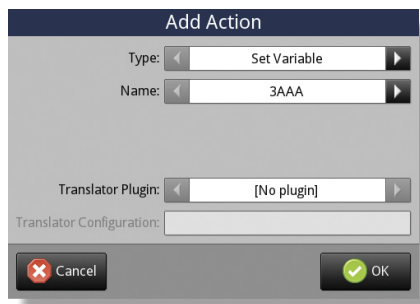


Figure 64 - Add action (variable)

Tap the *Add* button as shown in Figure 63 to display the *Add Action* window.

Set the *Type* widget to *Set Variable* and select the required variable from the *Name* widget. In the example shown opposite, the variable named 3AAA has been selected.

When the barcode on an approaching print target is read, the variable 3AAA will be set so that it contains the same information as the barcode. Any message containing the variable 3AAA will be updated to reflect the new

information.

Select Database Row. The barcode information on an approaching print target will determine which instance (row) of the PCM's database will be used for printing a database message. For further information and an understanding of database messages refer to "Database Messages" on page 71.

A database must have been imported to the PCM for this function to work. In addition, the appropriate database messages must have been created.

The settings under the *Advanced* tab of the chosen *Installation* must also be correctly set. Information describing these procedures can be found under “Database Selected” on page 72.

When the barcode on an approaching print target is read the PCM will search for a match in its database. The database is searched using the column specified in the *Database Column* widget, as shown in Figure 65.

The data in the database instance (row) that contains the match will then be used for printing the next database message. In the example shown in Figure 65, the column *Product* will be searched for a match.

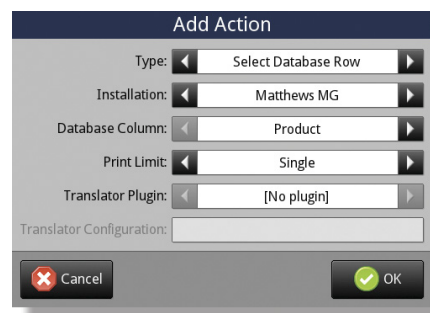


Figure 65 - Add action (database)

If for example, the barcode’s data contained the information: *Apples*, the information for the product *Apples* would be printed in the database message. Refer to Figure 71, on page 71 for an example of this database.

Select Message. The barcode information on the approaching print target is used to select a message for print. Once the barcode has been read the PCM will search the selected Installation’s messages for a match. The message that is named exactly as the barcode’s information is then selected for print.

Plugin. This option is for customer specific solutions and does not provide any functionality in the standard version of the software. For further information contact your local Matthews dealer.

Printer

Configuration settings for a print setup (*Installation*) and its PTMs can be managed using the *Print Heads* button.

The output signal for a PTM’s output pin can be configured using the *External I/O* button. These functions are discussed in more detail below.

Print Heads

Tapping the *Print Head* button will display its corresponding window, as shown opposite.

All *Installations*, their *Markers*, and their print heads are listed in a tree form on the left-hand-side of the window.

An *Installation* is the fundamental building block for a physical print setup. All print setups, their equipment and settings are configured in the PCM as an *Installation*.

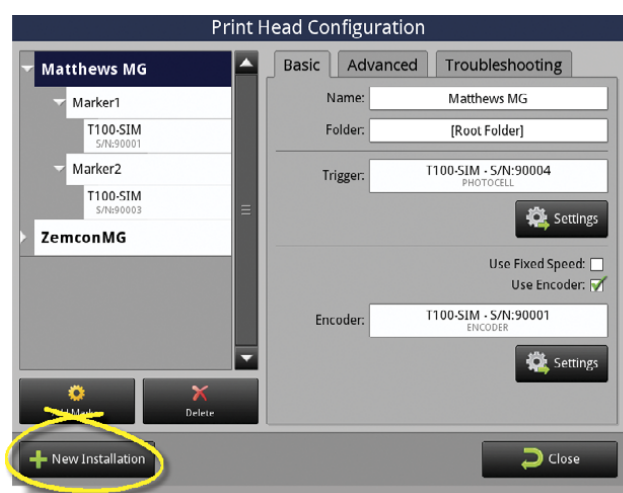


Figure 66 - Print Head Configuration window (Basic)

In Figure 66 there are two *Installations* displayed on the left-hand-side. The settings for the *Installation* named *Matthews MG* are displayed on the right-hand-side.

The tree structure on the left shows that *Matthews MG* consists of two *Markers*: *Marker1* and *Marker2*. Each *Marker* has one print head, a T100-SIM. The serial number of each print is displayed underneath.

Selecting any of the tree's different levels will display the corresponding settings on the right-hand-side. These can then be edited as required. For further information regarding these settings refer to “Settings” on page 16.

New *Installations* are created by tapping the *New Installation* button located on the bottom of the window, as highlighted above.

When a new *Installation* is started the PCM will guide the user through a step-by-step guide. After completion the *Installation* will be displayed on the left-hand-side, as shown above. All settings for the installation can be reviewed and changed afterwards, if required. For further information regarding the step-by-step guide refer to “Guided Installation” on page 11.

Basic and Advanced Settings. These allow the user to set basic and advanced settings for both *Installations* and *Markers*. A description of these settings is provided under “Settings” on page 16.

The settings for working with database messages can also be set for each *Installation* using the *Advanced* settings. For a more detailed understanding of database messages and how they are configured, refer to “Database Messages” on page 71.

Troubleshooting. Information regarding the state of an *Installation*'s encoder and photocell can be viewed by selecting the *Troubleshoot* tab, when an *Installation* is selected, as shown opposite.

This information can be useful for troubleshooting problems with the physical installation.

It can be used to verify both the setup and functionality of a photocell or an encoder.

The *Manual Trigger* button can be used to trigger the activation of a printout.

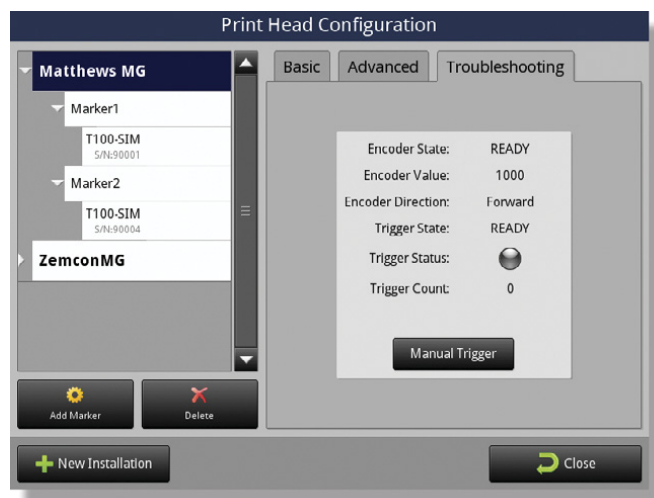


Figure 67 - Print Head Configuration (Troubleshooting)

External I/O

Output rules for the output-pin on a PTM can be configured. Whenever the condition(s) of a rule are met, a signal will be sent through the output-pin on the selected PTM.

Typically this would be used to activate a Matthews warning beacon that is connected to the PTM. Whenever the rule is met the warning beacon would be triggered, indicating, for example, that a PTM has a low level of ink. For further information regarding the warning beacon contact your local Matthews distributor.

When the *Add* button in the *External I/O Configuration* window is tapped, a simple wizard will start and the user will be prompted to enter a name for the new rule.

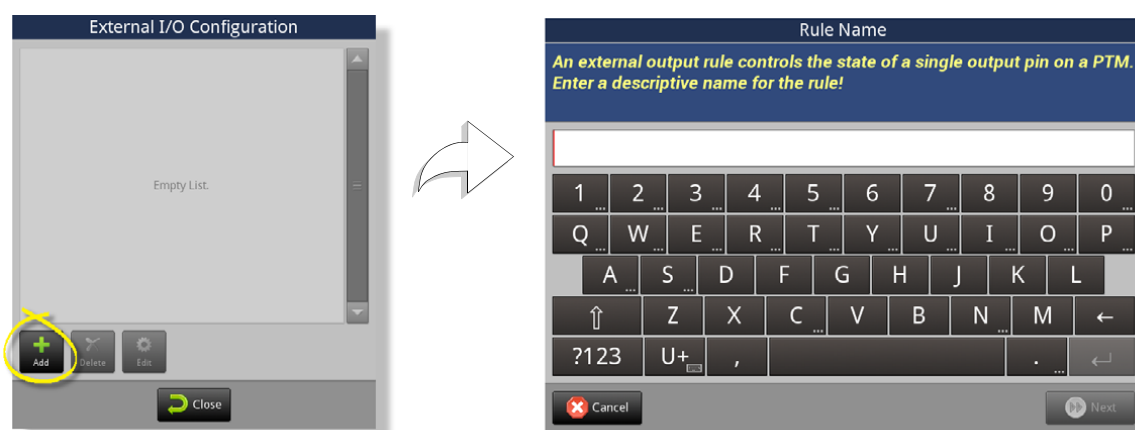


Figure 68 - I/O rule wizard

The wizard then guides the user through the process to create a rule for a chosen PTM. Either predefined rules can be selected or custom rules can be created.

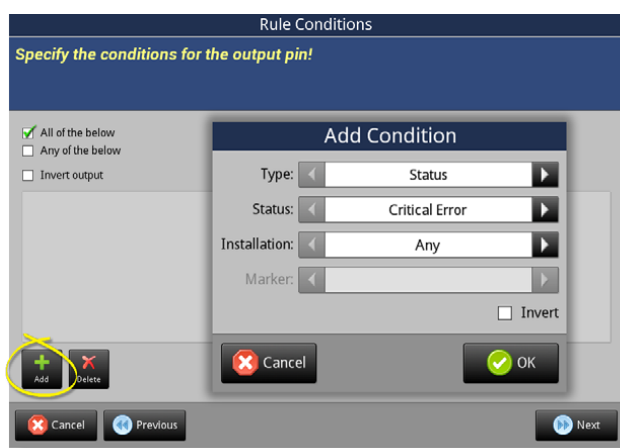


Figure 69 - External I/O

simultaneously. It is also possible to invert a specific condition, as shown in the *Add Condition* window, above.

If a *custom* rule is created, the user must add the condition(s). Tapping the *Add* button, shown opposite, will present the *Add Condition* window.

The desired condition(s) for the *Custom* rule can then be selected from those listed. More than one condition can be added if required.

The check box options: *All of below*, *Any of the below*, or *Invert output* can be set as required. The options *All of below* and *Any of the below* are exclusive – only one can be selected. They can not be selected

All created rules will be listed the next time the *External I/O* button is tapped. These can be edited to either include additional conditions or remove existing conditions, as shown opposite.

In the example shown the rule named *Ink Low and Critical Error* has two conditions: *Low ink level* and *Critical Error*.

The check box option *Any of the below* is checked, so if any of the conditions are met, a signal will be output through the selected PTMs output-pin.

Figure 70 - Edit external I/O rule

Database Messages



The PCM has a database function which allows the user to create messages that are related to a stored database in the PCM.

The database must have been imported first, before it is possible to create messages that work with it. A database is imported using the USB ports on the PCM's interface panel. Once imported it can be accessed and managed from the *Maintenance* menu, under *Data*. Refer to "Database" on page 50 for further information regarding the management of a database.

In the example shown below, a simple database that has five attributes (columns): *Product*, *origin*, *Weight*, *BestBefore* and *Box Size*, is displayed.

Manage Database					
Product	Origin	Weight	BestBefore	Box Size	
Apples	Italy	10 kg	1	LARGE	<p>Five Instances (rows) in the database: <i>Apples</i>, <i>Bananas</i>, <i>Oranges</i>, <i>Grapes</i>, and <i>Physalis</i></p> <p>Each Instance has five Attributes: <i>Product</i>, <i>Origin</i>, <i>Weight</i>, <i>BestBefore</i>, and <i>Box Size</i></p>
Bananas	India	20 kg	2	LARGE	
Oranges	Marocco	5 kg	5	LARGE	
Grapes	Spain	1 kg	5	SMALL	
Physalis	Columbia	250 g	6	SMALL	
					<p>Abc Edit Cell</p> <p>Add Row</p>

Figure 71 - Imported database

Lets assume that each of the products, listed in the database above, are to have a message printed on their boxes. The message for each product's box will use the same format in all cases. The only difference being the actual values of the attributes, as listed in the database above.

The required message must contain the attributes (columns): *Weight*, *Product*, and *Origin*, as shown opposite.

To insert the three database attributes the user must first tap the work grid, then select *Text* from the *Object Type* window.

The database's attributes can then be selected by tapping the *Database* button, as highlighted opposite. A list of the attributes will be displayed which can be inserted in to the *Text Value* window, one at a time.

Once the OK button is tapped the three attributes will be inserted in to the *Editor's* work grid as one text string, which can be edited as required.



Figure 72 - LARGE message

Saving the message with the name “LARGE” will allow the user to work with the database in two different ways, as described below. The name ‘LARGE’ has been specifically chosen which will become more clear in the following text.

The message can be used either as: a **Manually** selected message, or as a **Database** selected message. We will first consider *Manually* selected messages and then *Database* selected messages.

Manually Selected

Selecting the message “LARGE” from the *Select Message to Print* window, shown opposite, will display a preview of it on the left-hand-side of the window. The details for the product *Apples* are displayed.

When the user wants the message “LARGE” to print the details of a different product in the database, they can simply use the database widget at the bottom of the window. The database widget is automatically displayed whenever a database message is selected.

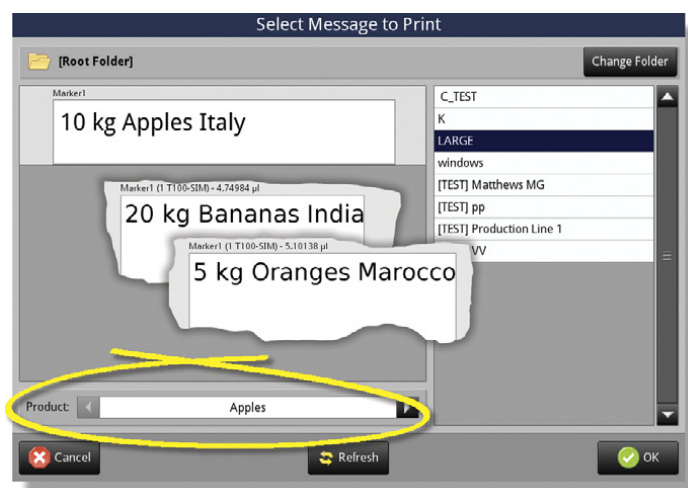


Figure 73 - Using the database widget

Changing the database widget to *Bananas* will automatically change the message so that the attribute values for *Bananas* are displayed instead. Likewise, the same will happen when the database widget is set to *Oranges*, as shown.

The above example demonstrates how the database can be used with *manually* selected messages — the message “LARGE” was manually selected from the *Select Message to Print* window.

Database Selected

It is also possible to configure the PCM so that messages are automatically selected. The message selection is determined by a value of an attribute (column) in the database. To further clarify this lets first assume that a new message SMALL has been created.



Figure 74 - SMALL Message

The new message has a similar format, it contains the database attributes: *Weight, Product, Origin*.

In addition, it contains a barcode and the following text “Small box message”, as shown.

Let us now assume that we want all instances in the database that have the value SMALL, for the attribute *Box Size*, to be printed using the message SMALL. Likewise, we want all instances that have the value

LARGE for the attribute *Box Size*, to be printed using the LARGE message. Refer to Figure 71 above.

To achieve this objective we need two messages, one named LARGE and the other SMALL, which we already have. The names of the messages are important. They must be named **exactly** as they are in the database. Lowercase is not the same as uppercase.

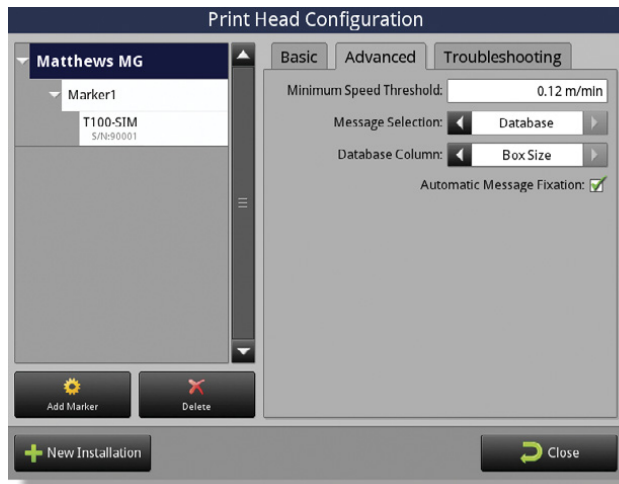


Figure 75 - Setting database options

The next step is to set the *Installation's Message Selection* setting to *Database*, and its *Database Column* setting to *Box Size*. These can be accessed from the *Installation's Advanced* settings in the *Configuration* menu, as shown opposite.

Setting the *Message Selection* widget to *Database* lets the PCM know that messages should be selected using an attribute of the database.

Selecting the attribute *Box Size* from the *Database Column* widget lets the PCM know that it is the referenced attribute (column) to use when selecting messages.

Once the *Close* button is tapped the database message will be configured and ready to use.

Selecting a message for print will now result in the *Select Product* window being presented to the user, as shown in Figure 76 below.

Note how it is different to that shown in Figure 73. In the above example the user must select a **message** for print. In the opposite example the user must select the **product** for print.

The actual message that will be used is dictated by the *Box Size* attribute. The products: *Apples*, *Bananas*, and *Oranges* will be printed using the LARGE message, as they all have LARGE for the attribute *Box Size*.

Likewise, *Grapes* and *Physalis* will be printed using the SMALL message, as they have SMALL for the attribute *Box Size*.

In this example the attribute *Box Size* has only two different values: LARGE and SMALL. It is possible that the attribute has more values. Say for example four, such as: LARGE, MEDIUM, SMALL, and PACKET. In such a case four messages would be required. The messages must have **exactly** the same names as the attributes' values (case sensitive). Any of the database's attributes (columns) can be used in a similar way.

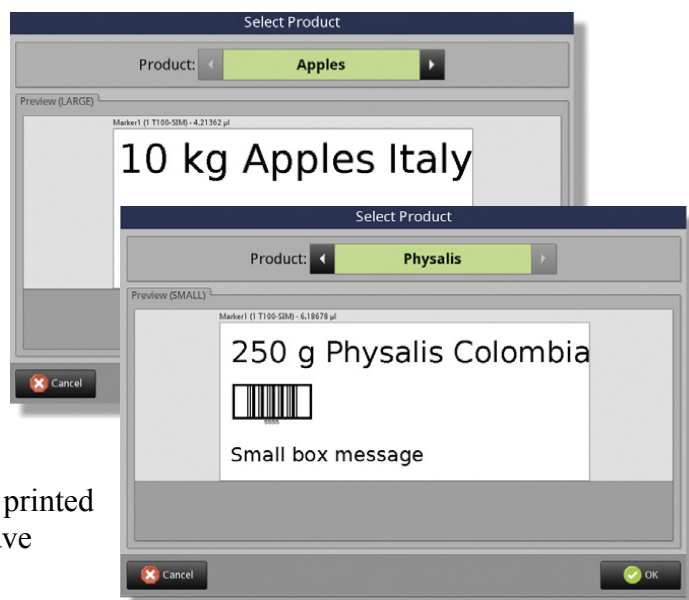


Figure 76 - Select product window

Each *Installation* can have its *Message Selection* method independently set to either *Database* or *Manual*. When selecting messages from the *Overview* menu the *Select Message* button will change for each *Installation*'s setting. Either *Select Message* or *Select “Attribute”* will be presented to the user. The actual string displayed for “Attribute” is the attribute that is chosen in the *Manage Database* window as described below.

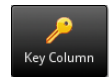
The Database Widget

The attribute (column) of a database that is displayed in the database widget, as shown in Figure 73 and Figure 76 above, can be set to any one of the attributes in the database. In the above figures the attribute *Product* has been selected. It is also possible to select any of the attributes: *Origin*, *Weight*, *BestBefore*, or *Box Size*.

If the attribute *Origin* was selected then the database widget would be named *Origin* and display the values *Italy*, *India*, *Morocco*..., as listed in the database. Refer to Figure 71, on page 71.

To change the attribute that is displayed in the database widget, first select the *Maintenance* tab at the top of the UI screen and then the *Database* button.

Select a cell of the desired attribute (column), then tap the *Key Column* button at the bottom of the database window to set the option. Refer to *Key Column* on page 51 for further information.

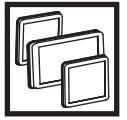


Other Database Uses

The PCM's database, as described above, can also be used with the following:

- Date/Time Offsets — Refer to “Date/Time” on page 36.
- Image objects — Refer to “Image Objects” on page 42.
- Bar Code Scanners — Refer to “Bar Code Scanner Support” on page 65.

PCM Hardware

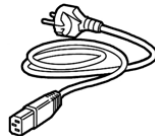


In the Box

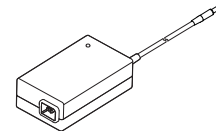
Each PCM is delivered with the following equipment. Please inspect the contents of the packaging and make sure that all the equipment is included. Make sure that there is no damage as a result of shipping. If there are any discrepancies, please contact you local Matthews dealer for further advice.



Viacode PCM



Mains Power-Supply-Cable



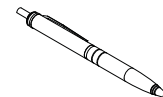
Power-Supply-Pack



Operator Quick Reference Guide
and Technical Manual



Screw kit for mounting
12" PCM STD only



Touch screen Pen
12" PCM STD only

Figure 77 - Viacode PCM package contents

There are three different PCMs that can be delivered with the Viacode software installed. The difference between them lies in the capacity and specifications such as IP classification. An overview of each PCM is provided below.

12" PCM STD

Provided below is an overview of the 12" STD (Standard) PCM.

Interface Panel.

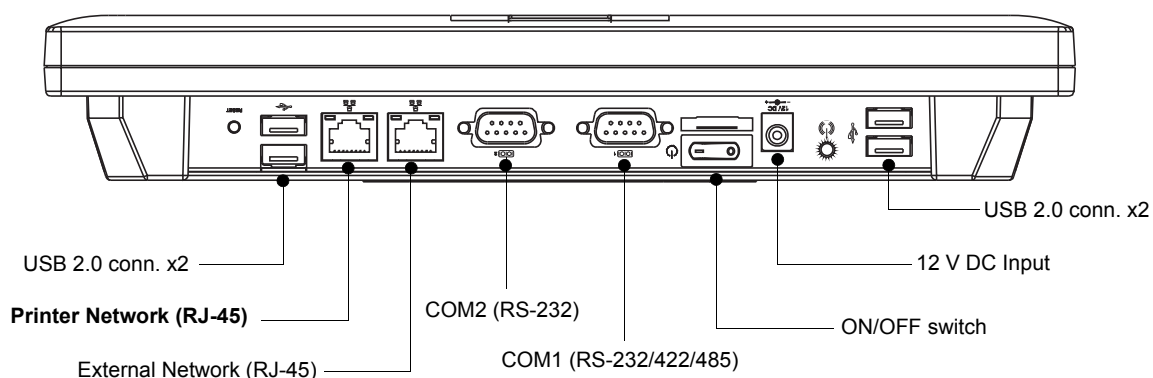


Figure 78 - 12" STD Interface Panel

Dimensions

- Net weight = 3.97 lb. (1.8 kg)

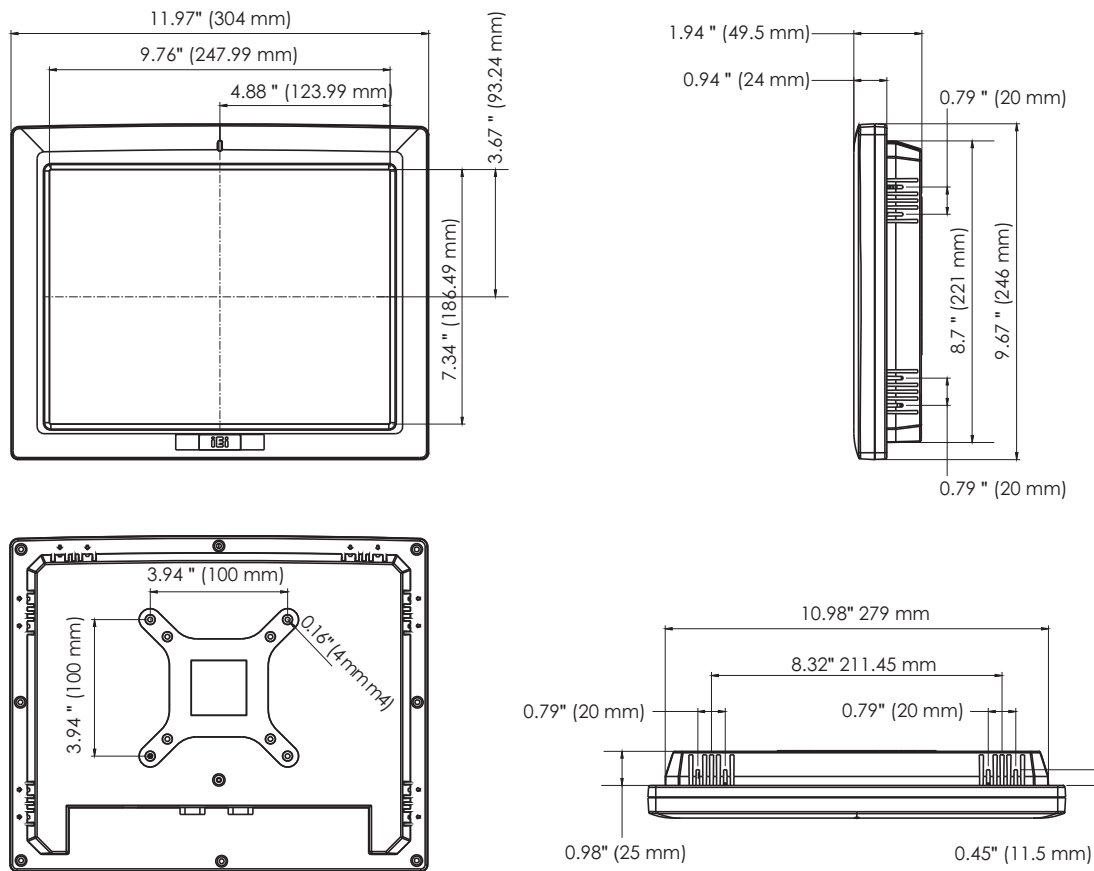


Figure 79 - 12" STD labelling

Technical Specifications

Table 17 - Technical Specifications (Sheet 1 of 2)(12" STD)

Feature	Specification
Operating Temperature:	-10°C – 50°C (50°F – 122°F) with CF Card 0°C – 40°C (50°F – 122°F) with HDD
Humidity Range:	20% – 90% RH
Rated Current:	32 W
Power supply adapter	Input: Single phase 90 – 264 VAC, 50/60 Hz
	Output: 12 V DC

Table 17 - Technical Specifications (Sheet 2 of 2)(12" STD)

Feature	Specification
Enclosure Classification – front panel only	IP-64 rating
Operating Environment:	The PCM must be free from vibration and correctly mounted.

12" PCM ADV

Provided below is an overview of the 12" ADV (Advanced) PCM.

Interface Panel

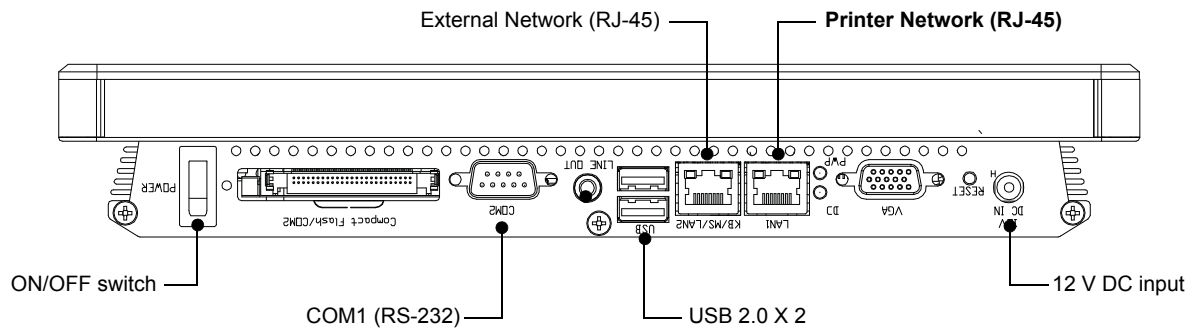


Figure 80 - 12" ADV interface panel

Dimensions

- Net weight = 6.26 lb. (2.84 kg)

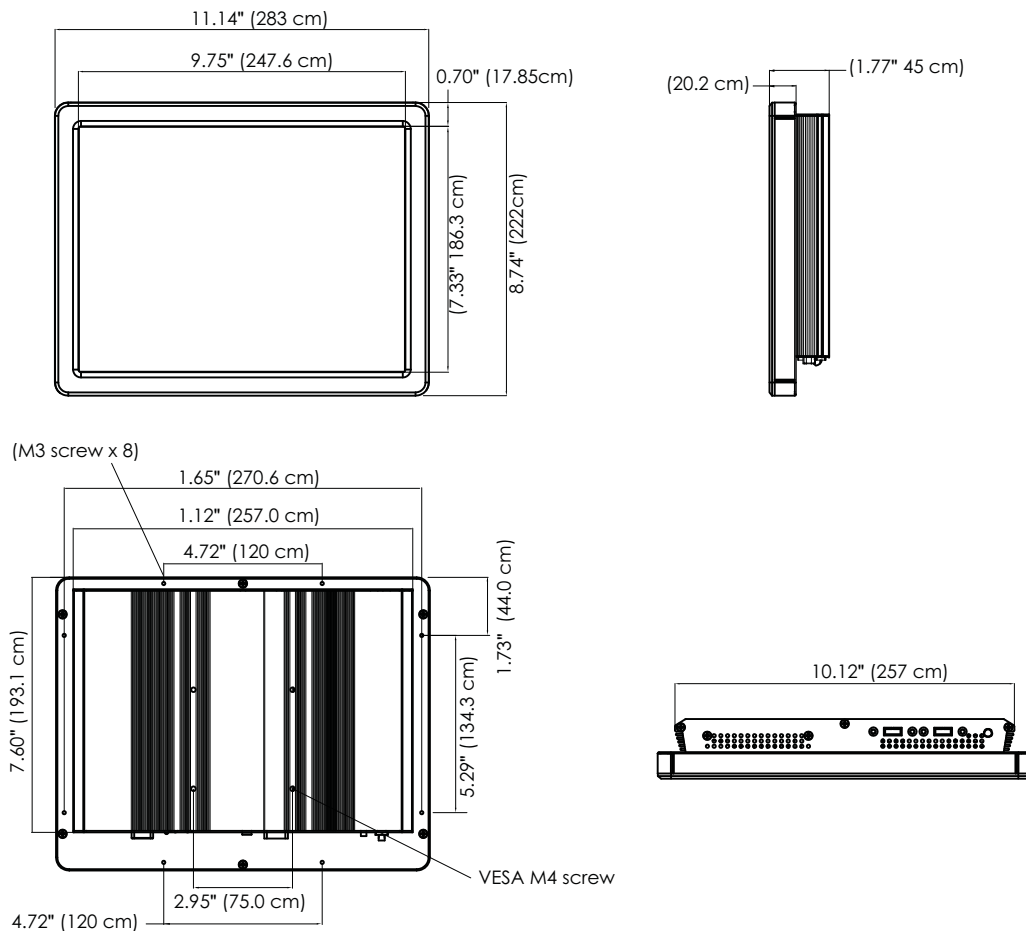


Figure 81 - 12" ADV dimensions

Technical Specifications

Table 18 - Technical Specifications (12" ADV)

Feature	Specification
Operating Temperature:	-10 ~ 60°C (14 ~ 140°F)
Humidity Range:	5 to 90% @ 40°C (104°F), relative humidity, non-condensing
Rated Current:	5A (60 W)
Power supply adapter	Input: 100 ~ 250VAC/ 47 ~ 63Hz
	Output: 12 V DC
Enclosure Classification – front panel only	IP-65
Operating Environment:	The PCM must be free from vibration and correctly mounted.

15" PCM IP65

Provided below is an overview of the 15" IP65 PCM.

Interface Panel

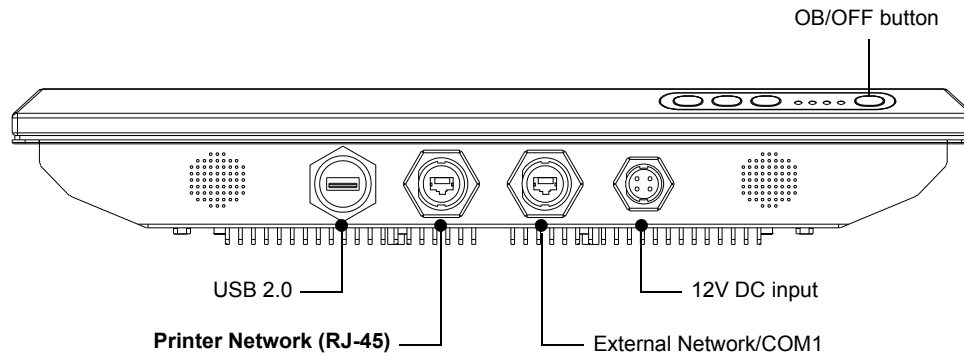


Figure 82 - 15" IP65 interface panel

Dimensions

- Net weight = 14.15 lb. (6.42 kg)

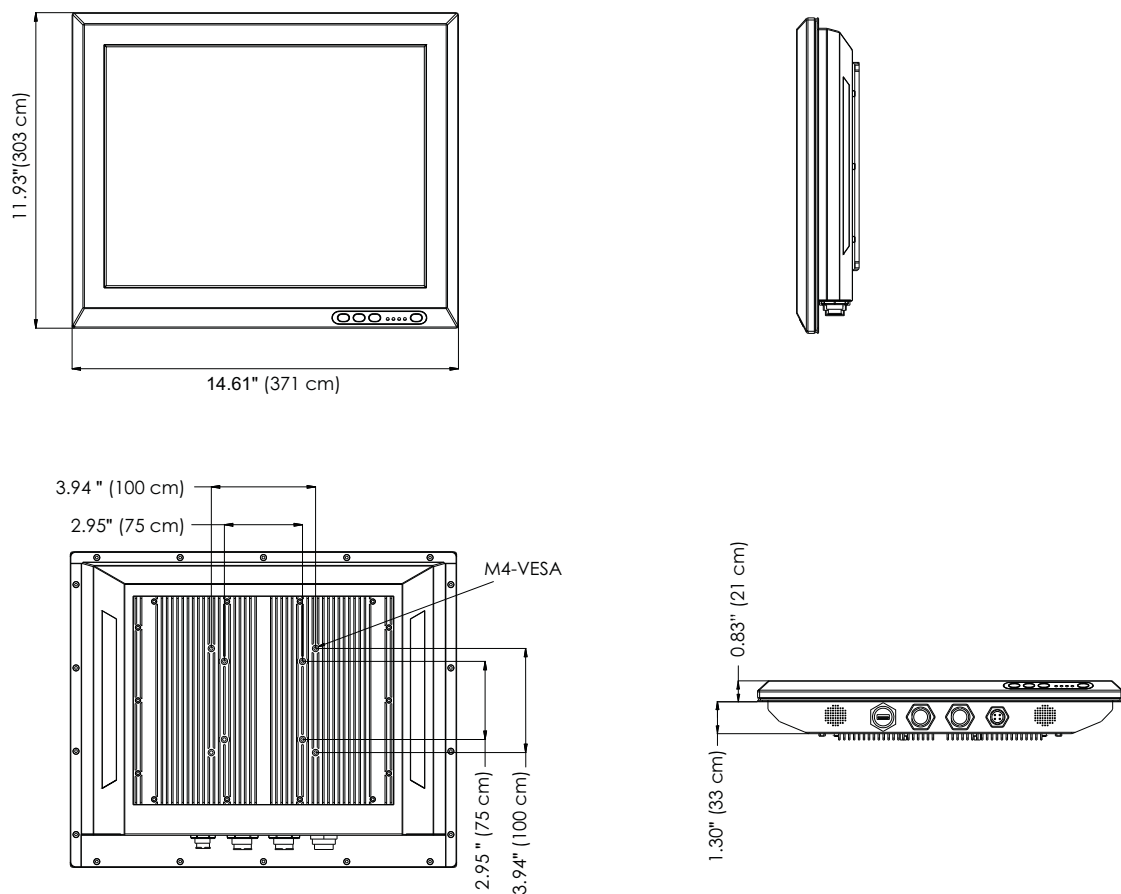


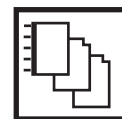
Figure 83 - 15" IP65, dimensions

Technical Specifications

Table 19 - Technical Specifications 15" IP65

Feature	Specification
Operating Temperature:	0 ~ 40°C (32 ~ 104°F)
Humidity Range:	5 to 90% @ 40°C (104°F), relative humidity, non-condensing
Rated Current:	5A (60W)
Power supply adapter	Input: 100 ~ 250VAC/ 47 ~ 63Hz
	Output: 12 V DC
Enclosure Classification	IP-65 rating
Operating Environment:	The PCM must be correctly mounted so that it is free from risk of falling.

Appendix



Troubleshooting

Provided below is a print troubleshooting guide. If none of the suggested remedies solve the problem, contact your local Matthews dealer for further advice.

Table 20 - Troubleshooting Guide

Fault	Possible cause	Remedy
No printout and no sound heard from the print head	No message selected for printout.	Select a message at the PCM.
	Selected message empty.	Check message contents at the PCM.
	PCM not switched ON	Switch the PCM ON.
	Print head cable not connected.	Connect cable correctly.
	Print head connected incorrectly	Check connections
	Incorrect print head settings	Check that the installations setting are correctly set in the PCM.
No printout or poor printout quality. <i>Refer to the print heads' manual for further information regarding troubleshooting.</i>	Print distance (throw distance) too much.	Move the print head closer to the print target. Refer to the print head's manual.
	Nozzle(s) blocked	Refer to the print head's manual for further information regarding the cleaning of blocked nozzles.
	Air in the ink system	Refer to the print head's manual for further information regarding the procedure for purging the ink system.

Speed Encoder’s Channel Setting

The *Channel* option as listed under “Settings [Encoder]” on page 16, determines how the PCM will interpret the signals from channel A and channel B of a speed encoder.

The default option is *Quadrature 2x*. If this setting is changed the *Pulses Per Meter* setting must also be correctly calculated to reflect the change. This can be calculated as follows:

$$\text{Channel factor} \times \left(\frac{\text{Resolution of encoder}}{\text{Circumference of encoder wheel (m)}} \right) = \text{Pulses Per Meter}$$

Provided below in Table 21 are a number of examples to highlight the correct settings:

Table 21 - Encoders channel settings

Encoder’s ppr	Encoder Wheel’s Circumference	Channel Option	Pulses Per Meter (ppm) to be entered
5 000	0,2 m	A	$1 \times \left(\frac{5000 \text{ ppr}}{0,2 \text{ m}} \right) = 25000 \text{ ppm}$
5 000	0,2 m	Quadrature	$1 \times \left(\frac{5000 \text{ ppr}}{0,2 \text{ m}} \right) = 25000 \text{ ppm}$
5 000	0,2 m	Quadrature 2x (default)	$2 \times \left(\frac{5000 \text{ ppr}}{0,2 \text{ m}} \right) = 50000 \text{ ppm}$

Note that the default option *Quadrature 2x* has a channel factor of two and that *Quadrature* has a factor of one. *Quadrature 2x* has a factor of two since both the positive and the negative edges of the signals are interpreted by the PCM for both channels.

The channel option A has a factor of 1 due to the fact that only the positive edge of the signal from channel A is interpreted by the PCM. Provided below in table Table 22 is a list of the correct channel factors to use for each option.

Table 22 - Channel factor

Channel Option	Channel factor	Channel Option	Channel Factor
A	1	A + B	2
B	1	2A + 2B	2
2A	2	Quadrature	1
2B	2	Quadrature 2x (default)	2

Barcode Objects

Table 23 lists the barcode types that the PCM supports, and their constraints.

Table 23 - Barcode types and their constraints

Barcode Type	Description	Constraints
Code 128	ASCII character set — variable length	ASCII character set
Code 39	Variable length, special character set	0 (zero) to 9 Upper-case A–Z, space, \$, %, *, +, -, ., /
Data Matrix ECC 200	Two dimensional barcode. Various matrix sizes. Refer to “Data Matrix Capacity (ECC 200)” on page 86 for further information.	Numeric only or ASCII
EAN 13	Must be thirteen digits in total. The user enters twelve digits, the last digit is automatically added to the barcode.	0 – 9
EAN 8	Must be eight digits in total. The user enters seven digits, the last digit is automatically added to the barcode.	0 – 9
GS1-128	Uses the bar code symbology Code 128 and adds Application Identifiers to it. Further information can be obtained from: http://www.gs1-128.info/ Refer also to “UCC Application Identifiers” on page 87 for a list of the Application identifiers.	Alphanumeric
GS1-Databar	Encodes GTIN-12 (Global Trade Item Number) or GTIN-13 in a fourteen digit structure.	Fourteen digits
Interleaved 2 of 5	Also referred to as I 2 of 5, or I 2/5. Must have an even number of digits.	0 – 9
ITF-14	Must be fourteen digits in total. The user enters thirteen digits, the last digit is automatically added to the barcode.	0 – 9
UPC-A	Must be twelve digits in total. The user enters eleven digits, the last digit is automatically added to the barcode.	0 – 9

Data Matrix Capacity (ECC 200)

Provided below are the various options for ECC 200 *Data Matrix* barcode objects. The constraints upon their data input are listed with regard to numeric input and alpha numeric input data.

Table 24 - GS1-Data Matrix barcode options

Matrix size Height x (Width)	Capacity		Matrix size Height x (Width)	Capacity	
	Numeric	Alpha num.		Numeric	Alpha num.
10×10	6	3	72×72	736	550
12×12	10	6	80×80	912	682
14×14	16	10	88×88	1152	862
16×16	24	16	96×96	1392	1042
18×18	36	25	104×104	1632	1222
20×20	44	31	120×120	2100	1573
22×22	60	43	132×132	2608	1954
24×24	72	52	144×144	3116	2335
26×26	88	64	18×8	10	6
32×32	124	91	32×8	20	13
36×36	172	127	26×12	32	22
40×40	228	169	36×12	44	31
48×48	348	259	36×16	64	46
52×52	408	304	48×16	98	72
64×64	560	418			

UCC Application Identifiers

A list of the Application Identifiers (AI) used with GS1 barcodes is provided below.

Table 25 - UCC Application Identifiers (Sheet 1 of 2)

Data Content	AI	Plus The Following Data Structure
Serial Shipping Container Code	00	exactly 18 digits
Shipping Container Code	01	exactly 14 digits
Batch Numbers	10	up to 20 alpha numerics
Production Date (YYMMDD)	11	exactly 6 digits
Packaging Date (YYMMDD)	13	exactly 6 digits
Sell By Date (YYMMDD)	15	exactly 6 digits
Expiration Date (YYMMDD)	17	exactly 6 digits
Product Variant	20	exactly 2 digits
Serial Number	21	up to 20 alpha numerics
HIBCC Quantity, Date, Batch and Link	22	up to 29 alpha numerics
Lot Number	23*	up to 19 alpha numerics
Quantity Each	30	
Net Weight (Kilograms)	310**	exactly 6 digits
Length, Meters	311**	exactly 6 digits
Width or Diameter (Meters)	312**	exactly 6 digits
Depths (Meters)	313**	exactly 6 digits
Area (Sq. Meters)	314**	exactly 6 digits
Volume (Litres)	315**	exactly 6 digits
Volume (Cubic Meters)	316**	exactly 6 digits
Net Weight (Pounds)	320**	exactly 6 digits

Appendix – Barcode Objects

Table 25 - UCC Application Identifiers (Sheet 2 of 2)

Data Content	AI	Plus The Following Data Structure
Customer PO Number	400	up to 29 alpha numerics
Ship To (Deliver To) Location Code using EAN 13 or DUNS Number with leading zeros	410	exactly 13 digits
Bill To (Invoice To) Location Code using EAN 13 or DUNS Number with leading zeros	411	exactly 13 digits
Purchase from	412	exactly 13 digits
Ship To (Deliver To) Postal Code within single postal authority	420	up to 9 alpha numerics
Ship To (Deliver To) Postal Code with 3-digit ISO Country Code Prefix	421	3 digits plus up to 9 alpha numerics
Roll Products - width, length, core diameter, direction and splices	8001	exactly 14 digits
Electronic Serial number for cellular mobile phone	8002	up to 20 alpha numerics

* Plus one digit for length indication

** Plus one digit for decimal point indication

Objects in Memory

All factory created fonts and images that are stored in the PCM's internal memory are listed below.

System Fonts

Provided below is an overview of the PCM's system fonts that are delivered with the unit. These fonts are divided in to Scalable and Bitmap fonts.

Scalable Fonts

Provided below is a list of the Scalable fonts.

Table 26 - Scalable fonts

Font Name	Example
Droid Mono (Regular)	Matthews
Droid Sans (Bold and Regular)	Matthews
Droid Serif (Bold, Bold Italic and Regular)	Matthews
Dejavu Mono (Bold, Bold Oblique, Book, Oblique)	Matthews
Dejavu Sans (Bold, Bold Oblique, Book, Condensed, Condensed Bold, Condensed Bold Oblique, Condensed Oblique)	Matthews
Dejavu Serif (Bold, Bold Italic, Book, Condensed, Condensed Bold, Condensed Bold Italic, Condensed Italic, Italic)	Matthews

Bitmap Fonts

Provided below is a list of the Bitmap fonts.

Table 27 - Installed font on the Viacode PCM (Sheet 1 of 2)

Font Name	Example
5×5	Matthews
7-Flex	Matthews
7×5	Matthews
9×7	Matthews
10×7	Matthews
14×10	Matthews
16-Nice	Matthews
16×10	Matthews
32	Matthews
32-Plain	Matthews
32-Serif	Matthews
32×10	Matthews
gth24	Matthews



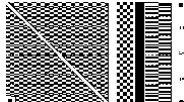






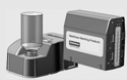
Table 27 - Installed font on the Viacode PCM (Sheet 2 of 2)

Font Name	Example
gth32	Matthews
kan15	Matthews
min24	Matthews
min32	Matthews

System Images

Listed below are the PCM's system images that are delivered with the unit.

Table 28 - System images

Image Name	Image	Image Name	Image
50MM_TEST_PATTERN		Gradient V	
100MM_TEST_PATTERN		Matthews Inkjet Large	
Baby Boy		Matthews Inkjet Medium	
Baby Girl 768		T100 Large	
Gradient H		T100 Medium	

Documentation History

Each Technical Manual has been written for a specific version of the Viacode PCM software. Table 29 lists which manual should be used with which software version.

Table 29 - Document history

Manual version number	Manual issue date (month/year)	Software version number	Major updates in manual
V2 I1	01/13	2.0	See note 2
V1 I1	01/12	1.0	See note 1
Note 2	Manual updated to reflect new software version.		
Note 1	First release.		

Notes

For the recording of miscellaneous notes

[illegible]

[illegible]

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