TYPE PR
DIGITAL REGISTER

INSTRUction MANUAL

To the Owner

Please read and retain this instruction manual to assist you in the operation of this product.

This Instruction Manual provides a instruction guide on the set-up and programming of the Type PR, 12mm LCD Digital Register.

Should you require further assistance please contact you local Macnaught representative.

Macnaught offer a comprehensive set web based support materials to compliment our product range.
Access the website by scanning the QR code.

WWW.MACNAUGHT.COM.AU

INTRODUCTION

SYSTEM DESCRIPTION OF THE Gx012P

Functions and features

The flow rate / totalizer model PR is a microprocessor driven instrument designed to display flow rate, total and accumulated total.

This product has been designed with a focus on:

ultra-low power consumption to allow long-life battery powered applications.

The glass reinforced polypropylene housing offers IP65 environmental protection.

Configuration of the unit

The PR has been designed to be implemented in many types of applications. For that reason, a SETUP-level is available to configure your PR according to your specific requirements.

It includes several important features, such as K-factors, measurement units etc. All setting are stored in EEPROM memory and will not be lost in the event of power failure.

Display information

The unit has a large transflective LCD with all kinds of symbols and digits to display measuring units, status information, trend-indication and key-word messages.

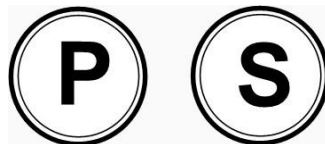Flow rate and totals can be displayed by using the S button to move through the various options..

A backup of the total and accumulated total in EEPROM memory is made every minute.

OPERATIONAL

GENERAL

This chapter describes the daily use of the PR Digital Register. This instruction is meant for users / operators.

CONTROL PANEL
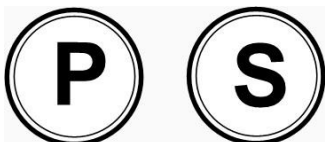
The following keys are available:

Functions of the keys

This key is used to program and save new values or settings.
It is also used to gain access to SETUP-level.

This key is used to SELECT the display defaults, ACC.TOTAL, RATE, TOTAL, BATCH
The key is also used in the setup program to scroll through the base levels and options in each level

Pressing both keys simultaneously to CLEAR the value for total and batch then press P for NO or S for YES to clear the total/batch.
In the setup mode pressing both keys simultaneously whilst in the upper levels of each of the functions will allow modification of the setting and pressing again will save setting.

PROGRAMMING SET-UP LEVEL

GENERAL

Configuration of the PR is done at SETUP-level. SETUP-level is reached by pressing the PROG/ENTER key for 7 seconds; at which time, setup will be displayed. In order to return to the operator level, PROG will have to be pressed for three seconds. Alternatively, if no keys are pressed for 2 minutes, the unit will exit SETUP automatically.
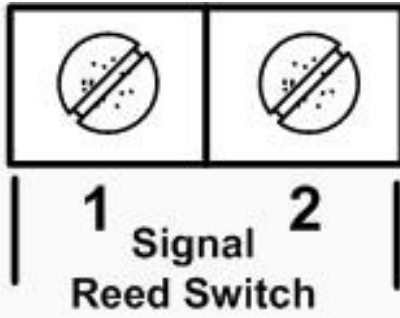SETUP can be reached at all times while the PR remains fully operational.

Press **P** For 7 Seconds
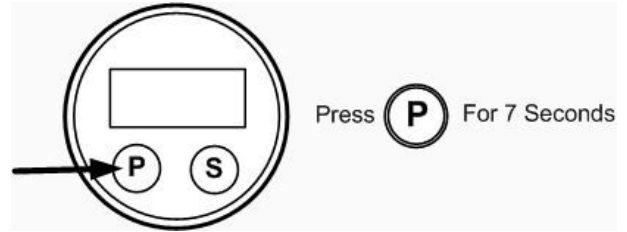
SETUP FUNCTIONS AND VARIABLES			
1	**TOTAL/BATCH TOTAL**		
	1.1	UNIT	L - m3 - UKGAL - USGAL - OILbbl -UKbbl –USbbl
	1.2	DECIMALS	0 - 1 - 2 - 3
2	**ACCUMULATED TOTAL**		
	2.1	UNIT	L - m3 - UKGAL - USGAL - OILbbl -UKbbl –USbbl
	2.2	DECIMALS	0 - 1 - 2 - 3
3	**RATE**		
	3.1	UNIT	L - m3 - UKGAL - USGAL - OILbbl -UKbbl –USbbl
	3.2	PERIOD	sec - min - hour
	3.3	DECIMALS	0 - 1 - 2 - 3
	3.4	CALCULATION	per 1 - 255 pulses (default 10)
	3.5	CUT-OFF	0.1 - 999.9 seconds (Default 35)
4	**METER**		
	4	METER SIGNAL	Reed Switch Only
	4.1	K FACTOR (Pulses per Unit)	0000.000 to 9999.999
5	**OTHERS**		
	6.1	TYPE	PR
	6.2	SOFTWARE VERSION	03.xx.xx
	6.3	SERIAL NO.	xxxxxxx

EXPLANATION OF SET-UP FUNCTIONS

SETUP PARAMETERS

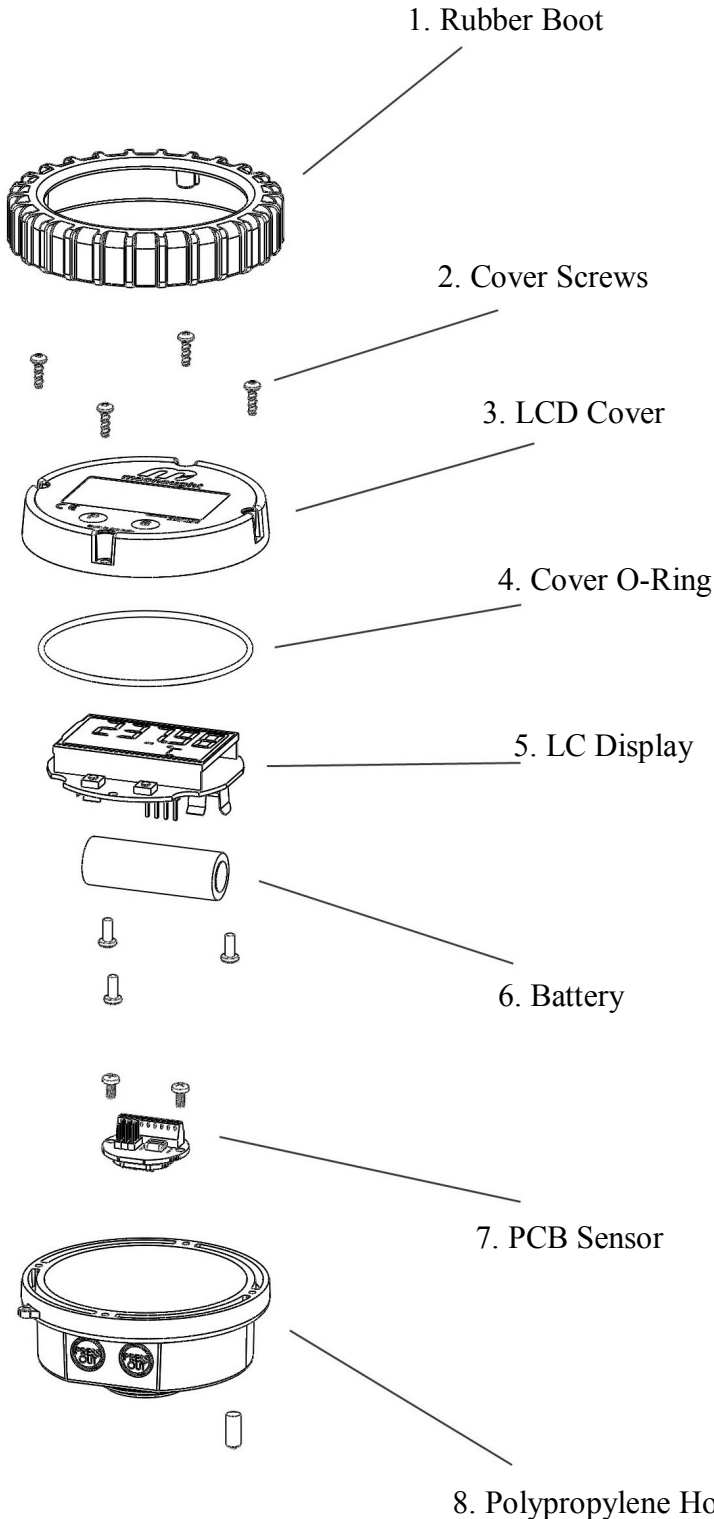|	
TOTAL/BATCH TOTAL **1.1**	SETUP - 1.1 determines the measurement unit for total and batch total The following units can be selected: L - m3 - UKGAL - USGAL - UKbbl - USbbl - OILbbl Please note that the K-Factor entered in 4.1 should be in pulses per litre and unit adjustment is done automatically.
DECIMALS **1.2**	The decimal point determines for total and batch total the number of digits following the decimal point. The following can be selected: 0000000 - 111111.1 - 22222.22 - 3333.333
TOTAL ACCUMULATED **2.1**	SETUP - 2.1 determines the measurement unit for accumulated total. The following units can be selected: L - m3 - UKGAL - USGAL - UKbbl - USbbl - OILbbl Please note that the K-Factor entered in 4.1 should be in pulses per litre and unit adjustment is done automatically.
Decimals **2.2**	The decimal point determines for accumulated total the number of digits following the decimal point. The following can be selected: 0000000 - 111111.1 - 22222.22 - 3333.333
Flow Note	*The settings for total and flow rate are entirely separate. In this way, different units of measurement can be used for each e.g. cubic meters for total and liters for flow rate.* *The display update time for flow rate is one second or more.*
RATE **3.1**	SETUP - 21 determines the measurement unit for flow rate. The following units can be selected: L - m3 - UKGAL - USGAL - UKbbl - USbbl - OILbbl Please note that the K-Factor entered in 4.1 should be in pulses per litre and unit adjustment is done automatically.
TIME UNIT **3.2**	The flow rate can be calculated per second (SEC), minute (MIN), hour (HR) or day (DAY).
DECIMALS **3.3**	This setting determines for flow rate the number of digits following the decimal point. The following can be selected: 00000 - 1111.1 - 2222.22 - 3333.333
CALCULATION **3.4**	The flow rate is calculated by measuring the time between a number of pulses, for example 10 pulses. The more pulses the more accurate the flow rate will be. The maximum value is 255 pulses. ***Note:** the lower the number of pulses, the higher the power consumption of the unit will be (important for battery powered applications).* ***Note:** for low frequency applications (below 10Hz): do not program more than 10 pulses else the update time will be very slow.* ***Note:** for high frequency application (above 1kHz) do program a value of 100 or more pulses.*
CUT-OFF TIME **3.5**	With this setting, you determine a minimum flow requirement thresh-hold, if during this time less than XXX-pulses (SETUP 26) are generated, the flow rate will be displayed as zero. The cut-off time has to be entered in seconds - maximum time is 999 seconds (about 15 minutes).
K-FACTOR **4.1**	With the K-factor, the flow meter pulse signals are converted to a flow rate. The K-factor is based on the number of pulses generated by the flow meter per selected measurement unit (SETUP 1.1), for example per liter. The more accurate the K-factor, the more accurate the functioning of the system will be.
	The setting allows a K Factor with up to 3 decimal places and 4 whole numbers eg; **1234.123**

PR

The PR unit cam only accept a reed switch input, this sensor has been selected as the most common sensor and requires very little power with small effect on battery life.

The 2 position terminal block is not polarity conscious so the reed switch wires can be connected in any order.

Connecting any other sensor type could cause damage to the electronics module

SERVICE KITS

1. Rubber Boot

2. Cover Screws

3. LCD Cover

4. Cover O-Ring

5. LC Display

6. Battery

7. PCB Sensor

8. Polypropylene Housing

SERVICE KITS	
Part Number	**Items**
MXS-DIS-PR	2. Cover Screws
	3. LCD Cover
	4. Cover O-Ring
	5. LC Display
	6. Battery
MXS-PCB-PR	7. PCB Sensor Board
	8. PP Housing

WALL MOUNT BRACKETS

The PR series is available with a Wall Mount Bracket option for applications requiring remote mount display. Following is a dimensional drawing for the wall mount bracket.

Ø90

54

54

12

4 x Ø5.5 holes to suit
countersunk screw head
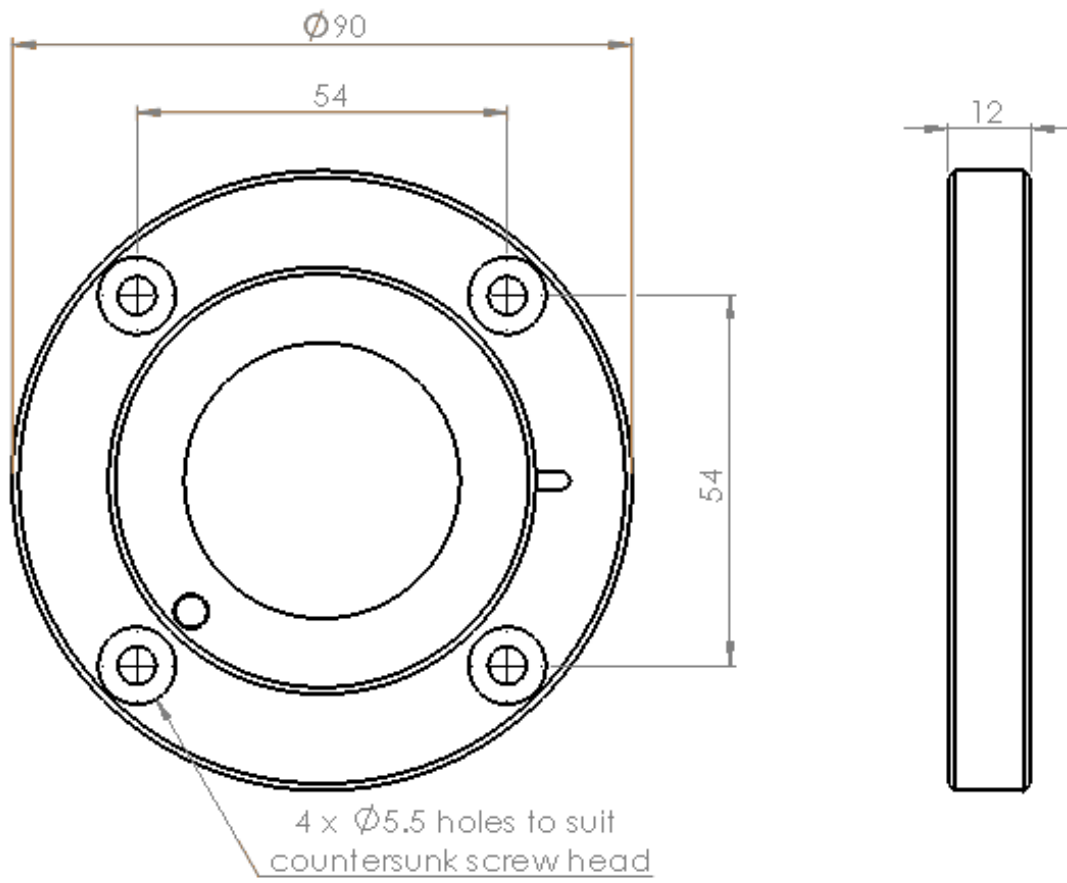
TECHNICAL SPECIFICATIONS

GENERAL

Display

Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Digits	Seven 12mm (0.47") and seven 8mm (0.31"). Various symbols and measuring units.
Refresh rate	Flow Rate: once per second. Total: 8 times/second after key press to one second.

Enclosures

General Control Keys	Aluminium with Polycarbonate window, silicone and EPDM gaskets. UV stabilized and flame retardant material. Two industrial micro-switch keys. UV-resistant silicone keypad.
Meter mount enclosures Classification Cable entry	Dimensions: 100mm diameter IP67 Black Anodised

Operating temperature

Operational	-20°C to +60°C (-4°F to +140°F).

Power supply

Battery powered	Lithium battery - life-time depends upon settings - up to 3 years @ 20°C.

Terminal connections

Type:	Terminal strip. Wire max. 1mm2

Data protection

Type	Backup of all settings and running totals in flash memory.

Environment

Electromagnetic compatibility	Compliant ref: EN 61326-1:2006, EN61010-1:2001

INPUT

Total / Batch total / Accumulated total

Digits	7 digits.
Units	L, m3, US-GAL, UK-GAL, US-bbl, UK-bbl, OIL-bbl.
Decimals	0 - 1 - 2 or 3.
Note	total and batch total can be reset to zero.

Operator functions

Displayed functions	Flow Rate. Total (can be reset to zero by the operator). Batch total (can be reset to zero by the operator). Accumulated total (non resettable)

Flow Meter

Type	reed-switch
Frequency	Total: minimum 0 Hz - maximum 120 Hz for total Flow Rate: 0.01 Hz – maximum 120Hz.
K-Factor	0000.001 - 9,999.999 pulses per unit of measure

Flow Rate

Digits	7 digits.
Units	L, m3, US-GAL, UK-GAL, US-bbl, UK-bbl, OIL-bbl.
Decimals	0 - 1 - 2 or 3.
Time units	/sec - /min - /hr .