FUNCTIONS OF KEYS

↵ RETURNS (or ENTER, EXE, etc.)

• Scrolls through main menu or submenu

| Read 1> | + | ↵ | → | Disp 2> |

| Flow Rng 1> | + | ↵ | → | Flow Unit 2> |

• Enters default or confirms existing value.

| Login En 1> 0? | + | ↵ | → | Login En 1> 0 |

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1 ↵   ALPHANUMERIC plus RETURN

• Selects menu (or submenu) item and advances to its first submenu

| Read 1> | + | 5 | ↵ | → | Anlg Fsd 1> |

| Anlg Fsd 1> | + | 3 | ↵ | → | Anlg Dir Fwd 1> |

• Keystrokes can be combined as a shortcut

| Read 1> | 5 | 3 | ↵ | → | Anlg Dir Fwd 1> |

• Selects submenu and displays current value. A '?' indicates current value is configurable

| Anlg Fsd 1> | + | 1 | ↵ | → | Anlg Fsd 1> 20? |

• Enters selected value at '?' prompt

| Anlg Fsd 1> 20? | + | 9 | ↵ | → | Anlg Fsd 1> 9 |

• Note. In some submenus, 1 = select, 0 = deselect

Q ↵   QUIT plus RETURN

• In main menu, exits system (Security access reverts to Level 0)

| Read 1> | + | Q | ↵ | → | Bye |

• In submenu, returns to top of main menu, or parent submenu

| Flow Rng 1> | + | Q | ↵ | → | Read 1> |

| Flow Unit Ltr 1> | | Q | ↵ | | Flow Rng 1> |

ESC   ESCAPE

• In any menu or submenu, returns to top of main menu

| Flow Unit Ltr 1 | + | ESC | → | > |

CONFIGURATION PROCEDURE

Main Menu	Submenus	Description
ABB Process ‡ MagMaster V 1.10 17/05/93		Indicates model variant software version, date ‡ or 'Slurry'

READ

Main Menu	Submenus	Description
Read 1>	Read Flow 1>	Flow rate in selected units
	Read % 2>	Flow rate in % of range
	Read Fwd 3>	Total in forward totalizer‡
	Read Rev 4>	Total in reverse totalizer‡
	Read Net 5>	Net total (fwd minus rev)
	Read Alm 6>	Current active alarms
	** Read Vel 7>	True flow velocity in m/sec, or ft/sec if flow units are in UGal or ft^3

‡ Resettable to 0 if Tot ClrEn is set.

DISPLAY OPTIONS

Main Menu	Submenus	Description
Disp 2>	Disp Mode 1>	0 = Single line display 1 = Double line display 2 = New line for each update (for printers, etc.)
	Disp Res 2>	Resolution of flow display Enter number of decimal places required (max. = 6)

PASSWORDS

See information in Security Access section for detailed description

Main Menu	Submenus	Description
Login 3>	Login En 1>	Current Security level 0 = default For default passwords Enter 'user' for Level 1, 'engineer' for Level 2. **Note**: enter these passwords in ALL lower case
	** Login Key 2>	Changes Level 1 password
	** Login Key 3>	Changes Level 2 password

FLOW MEASUREMENT*

Main Menu	Submenus	Description
Flow 4>	# Flow Rng 1>	Enter 100% primary range in selected units
	Flow Unit 2>	Enter '1' ONE place only

		Ltr	1>	Litres
		m^3	2>	Cubic meters
		IGal	3>	Imperial gal
		UGal	4>	US gallons
		ft^3	5>	Cubic feet

Main Menu	Submenus	Description
Flow 4>	Flow Mult 3>	Enter '1' ONE place only

		m	1>	Thousandths
		c	2>	Hundredths
			3>	Unity
		h	4>	Hundreds
		k	5>	Thousands
		M	6>	Millions

| | Flow Time 4> | Enter '1' ONE place only |

		s	1>	Seconds
		Min	2>	Minutes
		Hr	3>	Hours
		Dy	4>	Days
		Wk	5>	Weeks

| | Flow Rspns 5> | Nominal time constant for output in seconds. Enter display setting value. |

Display Setting	Seconds
0	0.6
1	1
2	2
3	3
4	4
5	8
6	15
7	30
8	60
9	120

| | Flow Probe 6> | # Ins 1> | Insertion factor |
| | | # Prof 2> | Profile correction factor |

Note. The two factors above must be set to 1.0 if not used.

| | Flow % 7> | Present flow as % of primary range. |
| | ** Flow Cutoff 8> | Minimum flow velocity in mm/sec, below which all outputs set to zero. |

ANALOG OUTPUT*

Main Menu	Submenus	Description
Anlg 5>	Anlg Fsd 1>	Enter 0 to 21. Output current in mA for 100% flow
	Anlg Zero 2>	Enter 0 to 21. Output current in mA for 0% flow
	Anlg Dir 3>	Enter '1' to select Select both parameters for bidirectional flow
		Fwd 1> Current responds to forward flow
		Rev 2> Current responds to reverse flow
	Anlg No2 4>	Secondary range as % of primary range
	Anlg mA 5>	Present output current, mA
	Anlg HART**	HART Variant only, see full manual

PULSE OUTPUT*

Main Menu	Submenus	Description
Pls 6>	# Pls Fact 1>	Enter output pulses per flow volume unit
	Pls Cutoff 2>	Flow rate in % of primary range, below which pulse output and totalizer stop
	Pls Max 3>	Maximum output freq. in Hz
	Pls Hz 4>	Frequency in Hz
	** Pls Idle 5>	Pulse output in idle (off)
	** Pls Size 6>	Enter pulse width in msec (will round up to nearest 10msec) 0 = square wave

TOTALIZER*

Main Menu	Submenus	Description
Tot 7>	Tot Unit 1>	See Flow Unit 2> for parameters
	Tot Mult 2>	See Flow Mult 3> for parameters
	Tot ClrEn 3>	Enables totalizer reset function from terminal, transmitter display or input contact

ALARMS*

Main Menu	Submenus	Description
Alm 8>	Alm No1 1>	Any combination of alarms 1 = Select 0 = Deselect

		Idle	1>	Idle state
		En	2>	0 = Disabled 1 = Enabled
		Fault	3>	Measurement fault
		Fwd	4>	Forward flow
		Rev	5>	Reverse flow
		Cutoff	6>	Pulse output cutoff
		Mtsnsr	7>	Empty sensor
		Hi	8>	High flow
		Lo	9>	Low flow
		Anlg	A>	Analog output overrange
		Pls	B>	Pulse output overrange

| | Alm No2 2> | Same parameters as No.1 Factory default – Rev flow enabled, required for dual current option |

	Alm Trip 3>	Hi	1>	High flow trip-point, % range
		Lo	2>	Low flow trip-point % range
		Hyst	3>	Hysteresis
		Disp	4>	Enables display of Hi and Lo Alarms

INPUT CONTACT*

Main Menu	Submenus	Description
Input 9>	Input Analg 1>	Enter '1' to select. Active level selects second analog range
	Input Clr 2>	Active level resets all totalizers
	Inpt Hld 3>	Active level holds flowmeter flow value
	Inpt Zero 4>	Active level selects downscale drive
	** Inpt Idle 5>	Enter inactive state of input contact 1 = Hi normal, 0 = Lo normal

EMPTY PIPE DETECTION**

Main Menu	Submenus	Description
Mtsnsr A>	Mtsnsr Trip 1>	Enter empty pipe detector trip threshfold **Note**. Set to zero for a 'slurry' MagMaster
	Mtsnsr mV 2>	Measured indication used for empty pipe trip. When valve below 'trip' threshold then all outputs driven to zero

SENSOR DATA AND CALIBRATION**

Main Menu	Submenus	Description
Snsr B>	Snsr No 1>	Serial number of sensor
	Snsr Tag 2>	Tag number of sensor
	Snsr Size 3>	Calibrated bore (mm)
	Snsr Vel 4>	Present velocity in sensor
	Snsr Fact 5>	1>, 2>, 3>, 4> = calibration data. Same as on sensor data label

SYSTEM TEST**

Main Menu	Submenus	Description
Test C>	Test Mode 1>	If '1', transmitter is in test mode. Self-cancels after 30min. if no entry made
	# Test Flow 2>	Present flow rate. In test mode, any value may be entered manually
	Test % 3>	Flow rate in %‡
	Test Hz 4>	Output frequency in Hz‡
	Test mA 5>	Output current in mA‡
	Test Vel 6>	Flow velocity in sensor ‡
	Test Alm 7>	Current active alarms‡ Clr = none
	Test Txv 8>	Flow velocity, uncorrected for sensor calibration

‡ Calculated from Test Flow 2

*Requires Level 1 access   **Requires Level 2 access

The maximum no. must not exceed 21000. The value entered may display with a small error, e.g. 1.900 may display as 1.899. 1.900 is used in calculation

INTRODUCTION

The Magmaster™ provides high-precision electromagnetic flow metering for conductive fluids of >5μS/cm, in sizes of 2.5 to 2200mm (0.1 to 86 in.). It has state-of-the-art accuracy, repeatability and rangeability.

The MagMaster offers a choice of liners and electrodes, flange or wafer tubes, integral or remote electronics and an optional keypad display.

Standard outputs include fully-programmable analog output (0 to 21mA), dual pulse (forward and reverse), dual alarm (flow rate, fault conditions, etc) and a RS232 connection. Optional outputs include dual analog and RS422/423.

The MagMaster has been designed to eliminate traditional noisy signals in slurry applications. It has multiple self-monitoring and diagnostic functions , and a comprehensive test mode to test the system without interrrupting the process or power.

SIMPLE READ AND RESET

```
>43567 Ltr
12.328Ltr/s
```

Magnetic Wand
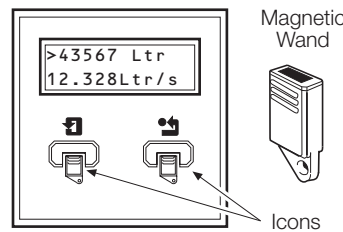
Icons

- Top line of display indicates flow totals, velocity, % of range and alarm status. Second line shows flow rate.

- Applying wand to the left icon steps the top line display through this sequence:

  >   Forward flow total

  <   Reverse flow total

  *   Net flow total

  Alm   Alarms in sequence ('Alm Clr' when no alarms are activated)

  Vel   Flow velocity

  %   Flow rate as % of full scale range

- Applying wand to right icon resets the flow total displayed on the top line if parameter 73 (Tot Clr En) is enabled

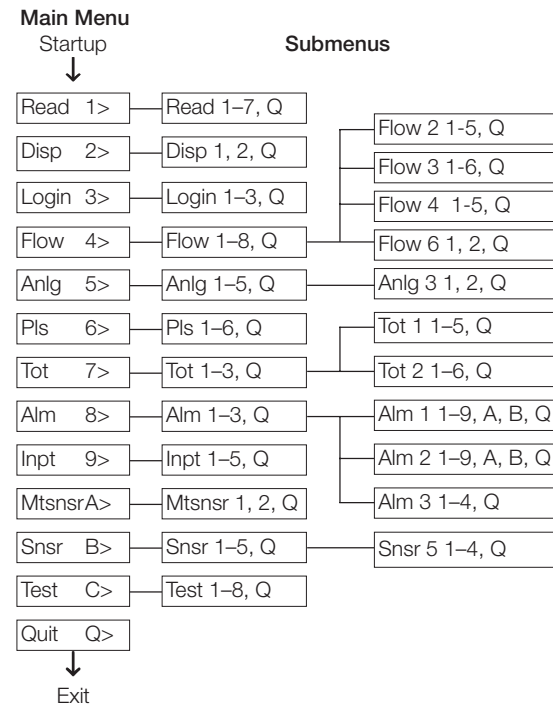- For keypad/display version, see separate Quick Reference Guide.

CONFIGURATION

1. Set up serial communications* on terminal or PC

2. For PC use a laplink/null modem cable. A cable is available from ABB .

3. Connect terminal cable to transmitter's D-connector as shown

4. Press RETURN or equivalent (ENTER, EXE, etc).
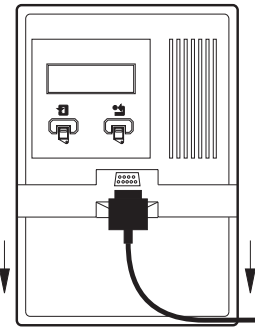
*Serial communications setup	
Baud rate	4800
Data bits	8
Stop bits	1
Parity	None
Handshake	None

RELATIONSHIP OF MENUS

Main Menu

Startup   Submenus

Startup	Submenu	
Read 1>	Read 1–7, Q	
Disp 2>	Disp 1, 2, Q	Flow 2 1-5, Q
Login 3>	Login 1–3, Q	Flow 3 1-6, Q
Flow 4>	Flow 1–8, Q	Flow 4 1-5, Q
Anlg 5>	Anlg 1–5, Q	Flow 6 1, 2, Q
Pls 6>	Pls 1–6, Q	Anlg 3 1, 2, Q
Tot 7>	Tot 1–3, Q	Tot 1 1–5, Q
Alm 8>	Alm 1–3, Q	Tot 2 1–6, Q
Inpt 9>	Inpt 1–5, Q	Alm 1 1–9, A, B, Q
MtsnsrA>	Mtsnsr 1, 2, Q	Alm 2 1–9, A, B, Q
Snsr B>	Snsr 1–5, Q	Alm 3 1–4, Q
Test C>	Test 1–8, Q	Snsr 5 1–4, Q
Quit Q>		

Exit

SECURITY ACCESS

Any of three security levels can be selected. In Levels 0 and 1, the operator is restricted to certain menus as listed below. In Level 2, the operator has full access to all menus and can change passwords.

1>   Read flow parameters, etc.
2>   Set display options   Level 0
3>   Security access, passwords

4>   Set flow parameters   Level 1
5>   Analog output
6>   Pulse output   Level 2
7>   Set totalizer parameters
8>   Alarm operation
9>   Input contact

A>   Empty pipe detection
B>   Sensor data and calibration
C>   Test operation

Quick Reference Programming Guide

MagMaster™
Electromagnetic Flowmeters