
Hawk 5E – Custom Display for Volumetric Mixers

Operators Manual

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INTRODUCTION

The Hawk 5E BC is a microprocessor based display/control unit, engineered to provide the Mobile operator with meaningful discharge information, printout and logging capability. It is designed to meet the unique requirements of the mobile volumetric mixer operator.

The display unit allows for the programming of up to 30 mix presets. The selected mix preset will cause the display to show the following:

1. The volume of product discharged in engineering units; cubic yards or meters
2. The weight of Sand and Stone discharged
3. The amount of water being added per yard of concrete and the water/cement ratio. (if optional water meter is installed)
4. The correct stone and sand gate settings
5. The specified strength of the concrete being poured
6. Batch control status
7. Raw conveyor pulse counts – for calibration / maintenance purposes. Job pulses are reset with “reset” key press. Total pulses do not reset with key press.

The Hawk 5E will send a RS232 serial communication stream to a printer, serial cell modem, computer or other hardware, if equipped, providing a hard copy or download of:

1. Company information
2. Date and time
3. Automatically incrementing ticket number
4. Conveyor pulse counts
5. Volume of concrete delivered in cubic meters or yards
6. Weight of stone and sand
7. Weight of cement
8. Total amount of water in the batch
9. Water / Cement ratio
10. Amount of admixtures added to the batch
11. Amount of admixtures per cubic yard or meter

On power up, the main “run” screen is displayed.

WHAT THE KEYS DO:

ADMIX: The Hawk 5E does not utilize the Admix key. No change in the screen occurs when the Admix key is pressed.

CURS: Causes a cursor to appear at the left side of the lines of display. When pressed and held, the cursor will scroll down through the lines of display. To program or change a line of display, the cursor must be showing beside the correct line.

DISP↑ and DISP↓:

Scroll between the lines of the various display and programming menus available. The cursor must be showing beside the line to be changed when the DISP keys are pressed.

ENTER: For future development – not utilized

INC/ON and DEC/OFF:

- Increase and decrease values when programming
- Activate recording of admixture pulses when in admix calibration mode.

MIX↑ and MIX↓:

Scroll between mixes in run and program mode

PRG: Program

Shows programming menus

PNT: Print, sends data to the printer or other download device

RST: Reset, zeros the job pulse counter and other values that accumulate with conveyor operation.

NOTE:

- ❖ **CURS – always causes the cursor to appear and to scroll**
- ❖ **DISP – Always moves to the next menu line**
- ❖ **INC/ON and DEC/OFF always changes a value or turns a function on or off**
- ❖ **PRG always causes the programming menus to show – and backs out of the programming menu.**

RUN DISPLAY (shows on power up)

MIX # - -	(CONCRETE TYPE)
LINE SELECTED BY	DISP ↑ and DISP ↓
LINE SELECTED BY	DISP ↑ and DISP ↓
LINE SELECTED BY	DISP ↑ and DISP ↓

RUN DISPLAY

Top line - Strength or user defined classification – as programmed for each mix

User set display lines – The following menu lines are selected by DISP↑ and DISP↓

- Total Pulses
- Job Pulses: Job pulses are zeroed on Reset
- Volume of concrete discharged: cubic yards or meters, zeroed on Reset
- Sand and Stone gate setting: show required gate settings for the selected mix, gate settings are established at calibration and set in programming mode.
- Sand weight: shows the weight of sand discharged after last reset.
- Stone weight: shows the weight of stone discharged after last reset.
- Water volume: calculated water volume in litres or US gallons; zeroed on Reset
- Admix 1: status Press PRG for admix 1 calibration routine. – Cursor must show
- Admix 2: status Press PRG for admix 2 calibration routine. - Cursor must show
- If your system has custom features such as additional admixtures, they will be added to this menu.

PROGRAMMING THE DISPLAY

Programming of the Hawk 6 is based on the data acquired during mixer calibration and from the concrete mix design being used. Before you begin to program the unit, the following data should be available:

- The conveyor pulse count per unit (Yard or Meter) of concrete for each mix.
- The correct Stone and Sand gate settings for each mix.
- The amount of Stone, Sand, and Cement per unit of concrete for each mix – taken from the mix design.

Programming the mixes:

The Hawk 5E allows for the programming of up to 30 mixes.

When the Run Display screen is showing, go into the **program mode** by first pressing the **CURS** key. Stop the cursor at the top line of the display and while the cursor is still showing, press the **PRG** key. The mix programming menu will appear.

Select the mix # to program by pressing MIX↑ or MIX↓.

Select the menu line to be set by DISP↑ or DISP↓.

Change values by pressing INC or DEC keys

Detailed programming steps

1. Using the DISP↑ or DISP↓ key, scroll to Units. Using INC and DEC, select PSI, MPA, or N - the engineering units of the strength of the concrete.
2. Using the DISP↑ or DISP↓ key, scroll to Strength, and using INC or DEC change the value displayed to the specified mix strength. If you would like a user defined classification,
3. Using the DISP↑ or DISP↓ key, scroll to Conveyor Pulses, and using INC or DEC change the value displayed to the number of pulses of the conveyor for one yard or cubic meter of concrete.
4. Using the DISP↑ or DISP↓ key, scroll to Sand and set the sand gate setting for the mix.
5. Using the DISP↑ or DISP↓ key, scroll to Sand WT and set the weight of sand per unit – from the mix design
6. Using the DISP↑ or DISP↓ key, scroll to Stone and set the stone gate setting for the mix.
7. Using the DISP↑ or DISP↓ key, scroll to Stone WT and set the weight of stone per unit – from the mix design.
8. Scroll to Batch Control – set the number of conveyor pulses for the batch

Programming menu summary:

Mix 1 - 30

Units -	PSI, MPA, or N (Newtons) – note – It metric units are selected (MPA or N) all references to weight and water will be metric values
Strength -	XX00 PSI or XX.X MPa
User Defined -	Alpha / numeric character set allows for a mix definition other than strength – i.e. “C25” Note: Strength PSI or MPA must be set to zero for user defined mixes to appear on the display
Pulses -	XXXX
Sand -	XX.X
Sand Wt. -	XXXX
Stone -	XX.X
Stone Wt. -	XXXX
Cement Wt. -	XXXX
Batch Control -	XXXX

Time:

Year -	00 - 99
Month -	1 - 12
Date-	1 - 31
Hour -	0 - 23
Minute -	0 - 59

To exit the programming mode and return to the run mode, press the PRG key.

Master Reset – to reset the totalized pulse count, press the RST key while powering up the unit.

General Hawk 5E Set-up Menu

When the default run screen is showing (appearing on power up), press the **PRG** key. A menu will appear that allows for the setting of the time, printed ticket information, and user configuration of the Hawk 5.

- Rounding

The display of Meters or Yards can be set to round to 1 unit, ½ unit, ¼ unit, or 1/10 unit. Use INC or DEC to change value. Other than “raw 1/10”, volumes are rounded up, meaning that if the display shows 1.5 units, the actual amount of concrete delivered is between 1.4 and 1.5 .

- Program Lock

To prevent unwanted programming changes, activate the program lock. To enable programming, press and hold the PRG during power-up.

- REM Display

An optional high visibility display is available. This parameter must be turned on for the high vis display to work.

- VOL Adjust

If the “Volume adjust” parameter is turned on, the volume of concrete printed on the ticket can be adjusted by pressing Inc or Dec before the ticket is printed.

- Save User Config

User programmed data can be saved and used as a back up in the event of an unauthorized person entering the program mode and changing the entered data.

- Load User Config

Loads the saved “User Configuration”

- Load Fact CFG

Loads Factory default data

- Company Info lines

INC or DEC scrolls through the alpha numeric character set

DISP up or down moves to the next character

To exit the line being edited, press PRG

- Adjust conveyor pulses

- Does not apply to Hawk 5

- Conveyor – calibrate pulses

- Does not apply to Hawk 5

- To exit the general programming mode and return to the run mode press PRG.

- Setting the Time

Enter the general set-up menu by pressing the PRG key.

Using the DISP↑ or DISP↓, advance to the set time function. Press PRG to enter the time set menu. Using the DISP keys and the INC/DEC buttons, adjust the date and time as required. Remember that the DISP keys change the lines of display and the INC/DEC keys change the values

PRINT FUNCTION

The print function allows for the selection of the following data to be sent to the printer:

- Delivery ticket
 - Log of mixer usage
 - Mix data
- To print a ticket press the PNT key. The default cursor indication is to “Print Ticket” Press the PNT key to send data to the printer.
- To print the Log or Mix data, move the cursor using the CURS key to that line and press PNT.

PRINT FUNCTION PROGRAMMING – Press the PNT key to display the print menu

- Delivery ticket – To specify which information is to be printed on the ticket, press the PRG key when the cursor is showing beside the Print Ticket line. DISP ↑ shows the next menu line and INC or DEC turns the function on or off.
 - The printer type is selected in this routine – select roll printer or slip printer.using steps above.
- Print Log – Press PRG when the cursor is showing beside the Print Log function. Using the INC or DEC keys, select the number log entries desired on the print out.

ADMIX FLOW METER CALIBRATION

In order to accurately record and print out the amount of admixtures injected, the Hawk 5 BC computer unit must “learn” the number of flow pulses per quart or litre.

1. Cause the desired admix calibration line to appear in the run display by moving the cursor to the line that you want it to appear on – then press DISP, scrolling through the available menu lines until Admix 1 CAL or Admix 2 CAL appears on that line.
2. Press INC/ON to zero the counter and prepare the Hawk unit to count admixture pulses.
3. Activate the corresponding admixture injection pump and fill one quart or one litre, depending on the system of measure being used.
4. Press the DEC/OFF key to put the pulse count to memory.
5. Manual entry mode allows for manual adjustment by pressing INC or DEC

WATER METER CALIBRATION

- The Water G (or L) line must appear on the run display. Follow instructions for “Setting up Run Display” on page 4. If you are using US measure, have a 5 US gallon container available. If metric, use a 20 litre container, to capture the mix water. If your mixer has a spray bar in the mix bowl, remove the rubber hose to direct all of the water into the measuring container.
- With the cursor showing beside “Water gallons (or litres)”, press PRG.
- The first of 2 programming screens will appear.
- The first screen allows for manual entry of pulses per 5 gallons (or 20 litres). Press INC or DEC to change the pulse value.
- Press DISP up to enter the “Auto Calibrate” routine.
 - Press INC (ON) to zero the water pulse counter and activate the routine.
 - Turn on water to the mix bowl and capture the 5 gallon (20 litres) container full.
 - Press DEC (OFF) to deactivate the routine and save the pulse count.
- The water meter is now calibrated.

USING THE HAWK 5E FOR MIXER CALIBRATION:

The display features of the Hawk 5E unit can be used to assist in calibration as well as for a “quick check” of the calibration of the mixer unit.

Before calibration, the following data for each mix or concrete type must be entered:

- The required amount of rock, sand and cement per cubic meter or yard – from the engineered mix design.
- The number of conveyor pulses per cubic meter or yard for each concrete type, as determined at step 1 of the calibration work sheet.

The programming procedure is outlined in the Hawk 5E manual.

When the conveyor is operated, the Hawk unit will use the entered programming data to calculate the correct amount of rock or sand discharged. The mix calibration process requires the operator to adjust the control gates and take samples until the actual weight delivered matches the weight displayed.

- Using the MIX key, select the mix to calibrate
- Press CURS to move the cursor to any of the bottom 3 display lines.
- Press DISP↑ or DISP↓ key and scroll to Stone WT or Sand WT
- Ensure that the belt is charged with aggregate to the discharge point
- Press reset to zero the display
- Discharge, capture and weigh an amount of material using a wheel barrow or other container
- Compare the discharged amount with the amount recorded on the display
- Set the control gate and take samples until the actual weight is the same as the recorded weight

Hawk 5E System

Connector Pin Out

1	+12 or 24 VDC	Red
2	Conveyor pulses - in	Grey
3	Water meter pulses – in	Yellow
4	Pump 1 Flow meter pulses – in	White
5	Pump 2 Flow meter pulses – in	Green
6	NC	
7	NC	
8	NC	
9	NC	
10	Printer serial – data out	Orange
11	NC	
12	NC	
13	NC	
14	NC	
15	NC	
16	System Ground	Blue