



BCM CONTROL SERIES

T7 Control Operator Manual

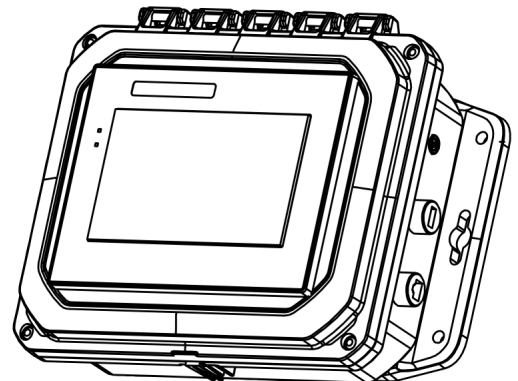
Daily operation, protected setup and application-specific modes

TECHNICAL MANUAL

Rev J | 2026.09.21

Document BCM-T7-OM

Core manual with application addendums



BearCat Pumps

1954 East Deer Valley Road, Suite 103 | Phoenix, AZ 85024

www.bearcatpumps.com | 623-587-1350



CONTENTS

Index

Click a blue section title to open it.

1	Overview and safety	3
	Scope, safe use and workflow	
2	Control identification	4
	Hardware and software-pair check	
3.1	T7 startup screen	5
	Screen anatomy and field reference	
3.2	Normal startup	6
	Preparation and startup sequence	
4.1	Manual Mode screen	7
	Daily-operation screen and feedback	
4.2	Manual controls	8
	Fixed speed, stopping and optional modes	
4.3	Desired Flow Rate operation	9
	Automatic flow regulation	
4.4	Target operation	10
	Slowdown, stopping and completion	
5.1	Meter Data	11
	Protected editing, saving and exit	
5.2	Control Setup (S)	12
	Advanced control parameters	
5.3	Protected field reference	13
	Meter, analog and target terms	
5.4	USB records and logging	14
	Record triggers and operator checks	
6	Service record and revisions	15
	Photos, support details and revision history	
ADD.	Application-specific modes	16
	Applicability and earlier mode names	
M-01	Tank Dose	17
	Ratio-based tank or truck dosing	
M-02	Drum Mode	18
	Additive flow from plant asphalt-cement flow	
M-03	Meter Only Mode	19
	Measurement and external target-stop output	

ONE CONTROL, ONE WORKFLOW

Identify the control, verify startup, operate in the configured mode and use protected setup only when authorized. Recipe Mode has its own operator manual.

Overview and safety

For operators and first-line service personnel using BearCat T7 controls with the screens and modes described here. Manual Mode is the primary daily-operation screen. This manual does not cover Recipe Mode or replace the pump, drive, electrical or installation instructions.

SAFE USE

The HMI is an operating interface, not an energy-isolation device. Before inspection or service, stop the process, follow the owner's lockout/tagout procedure and verify zero hazardous energy, including stored pressure and moving equipment. Use qualified personnel for electrical work.

Before operating the connected equipment

- Use the required PPE. Keep guards fitted and people clear of the pump and drive.
- Confirm the intended valve positions, an open flow path and suitable pressure protection for the connected positive-displacement pump. HMI limits do not replace that protection. A relief valve is not a pressure regulator: its opening pressure is not a guaranteed maximum. Performance depends on flow, speed, viscosity and the return path.
- Any pump that is heated or pumping hot liquid should be operated with Safety Blankets properly installed.
- Know the machine's normal and emergency stopping procedures. Stop and secure the equipment if there is unexpected motion, a hot-product leak, pressure release or electrical damage.

Use the manual in this order

Identify the control and software pair (2), verify startup (3.1-3.2), operate in Manual Mode (4.1-4.4), and use protected setup only when authorized (5.1-5.4). Use an addendum only when its mode is configured.

SCREENS AND SETTINGS ARE EXAMPLES

The example screens show HMI/PLC pairs T7.87 / 2026.087 and T7.88 / 2026.088. Names, values, enabled modes and behavior depend on the installed program pair. If the screen differs, confirm the correct instructions with BearCat before changing settings.

Control identification

Read the cabinet label to identify the hardware, then verify the software pair on the T7 startup screen.

Model number anatomy

BCM - DD2 - T7 - 1AC - PC10

Family / PLC / Display / Power / Case option

Code	Meaning	Example / check
BCM	BearCat control family	Use the full cabinet label when requesting service.
DD2	PLC type	C0-12DD2E-D family in the established BCM code.
T7	7-inch touch display	The startup title should read T7 Control.
1AC	Power-supply option	Use the electrical label and drawing to identify the required supply.
PC10	Optional case code	Options vary by build.

Software pair

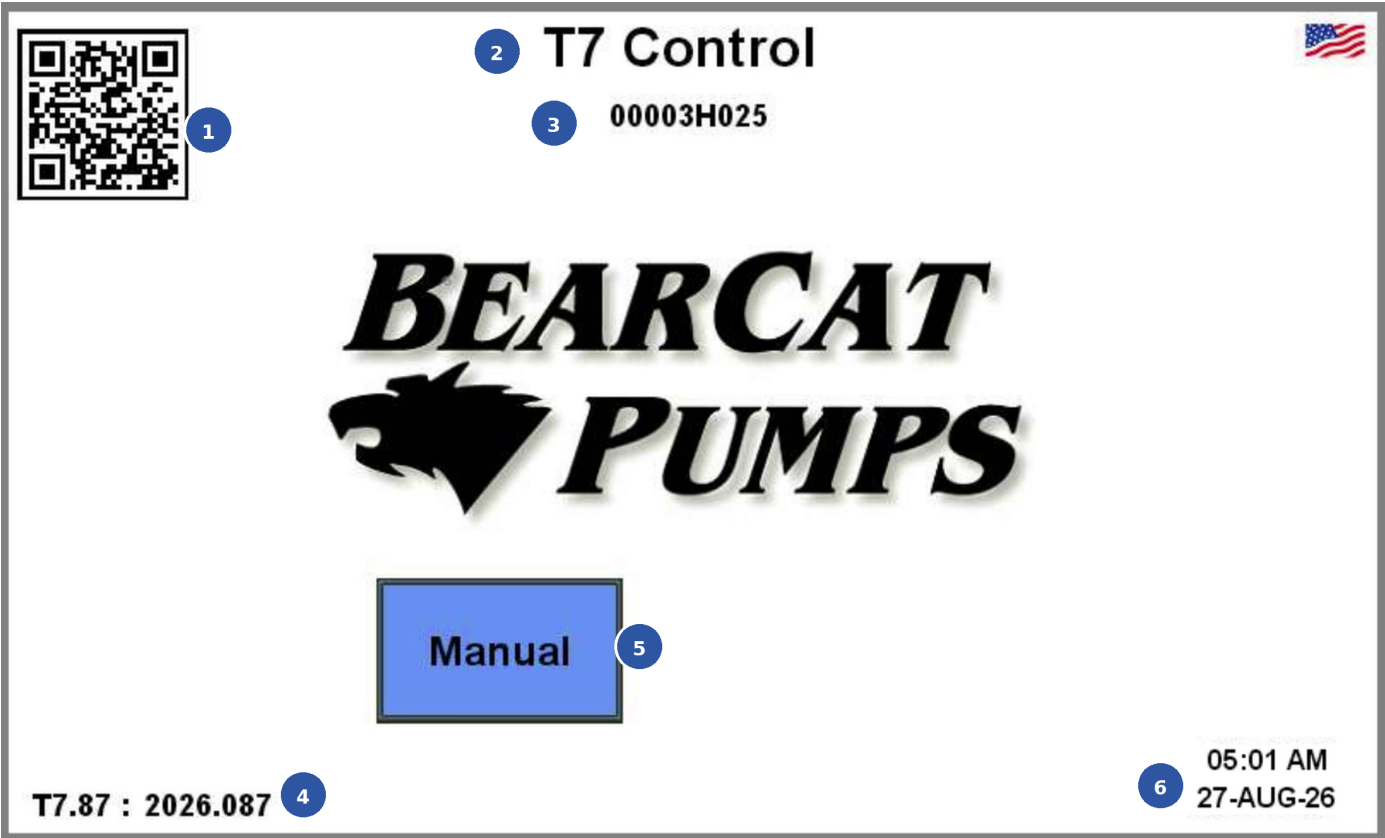
T7.87 : 2026.087

HMI PROGRAM PLC PROGRAM (example)

The HMI revision appears first; the PLC revision appears second. In the documented program pairs, the final two or three digits match: 87 and 087 in this example. Preserve leading zeros and punctuation when recording the values.

CONFIRM BEFORE CHANGING PROGRAMS

A zero PLC value or mismatched suffixes require confirmation of the installed program pair. Record the screen and contact BearCat before changing parameters or loading a program.



#	Field	What it tells you
1	QR code	Opens BearCat operating material, manuals and training resources.
2	Screen title	Confirms that the T7 application has loaded.
3	Configured name	Machine/system name; this example is 00003H025.
4	Software pair	HMI revision : PLC revision. A zero PLC value can indicate a communication problem.
5	Operating modes	Buttons populate from configuration. Manual is enabled in this example.
6	Clock	HMI date/time used for operator reference and timestamped records.

Screen values are examples; identify the installed control before use.

Normal startup

Prepare the connected equipment safely, then use this sequence whenever the T7 control is energized.

- 1 Prepare the system**
Confirm the intended flow path, valve positions, guards and pressure protection. Apply the hot-equipment precautions in [Section 1](#).
- 2 Energize and allow boot**
Apply power using the machine's normal procedure. Allow the HMI and PLC to finish starting.
- 3 Confirm the identity and software pair**
Check T7 Control, the configured name and both revision values. The documented example is T7.87 : 2026.087. If the name or pair is unexpected, obtain confirmation before operating.
- 4 Check the clock and records**
Correct the HMI clock before relying on timestamped records. Install the USB drive if the operation requires a saved record.
- 5 Select the required mode**
Manual Mode is the primary daily-operation screen. Use an application mode only when it is configured for that machine.

MODE AVAILABILITY

A missing or gray button can mean the mode is not enabled. Have an authorized person verify the intended setup. Do not enable a mode solely because it appears in this manual.

Current T7 documents and training: bearcatpumps.com/pages/documentsBCM.html.

Manual Mode screen

Manual Mode
00003H025

DFR off

Target off

Start (Hz)
20.00

Flow 0.000 lbs / min

Total 0.0000 lbs

RESET

R START

04:45 AM
29 JG-26

BEARCAT PUMPS
T7.88 2026.088

Feedback:
AMPS 0.00 Hz 0.00 Drive Gain % 1.1
Dens lbs/gal 8.3478 Sat % 100.0 % Temp F ° 77.474

#	Field	Function
1	Mode / name	Manual Mode and the configured system name.
2	Feedback	Meter and VFD readings, including amps, frequency and meter-health values.
3	S	Protected Control Setup access; see 5.2.
4	M	Protected Meter Data access; see 5.1.
5	Software pair	HMI revision on the left; PLC revision on the right.
6	Machine controls	RESET, yellow reverse R, and START/STOP.
7	Clock / exit	Touch the clock/date area to return to Startup.
8	Flow / total	Live flow rate and accumulated total in the selected units.
9	Start Hz	Fixed frequency used when starting in manual frequency control.
10	DFR / Target	Enables Desired Flow Rate control and/or an automatic stopping target.

Use this screen for normal daily operation. Values shown are examples.

Manual controls

Manual Mode can run at a fixed frequency, regulate to a Desired Flow Rate (DFR), stop at a target total, or combine DFR and Target.

PRESS-AND-HOLD CONTROLS

RESET, START/STOP and reverse R use an intentional delay of approximately one to two seconds in the documented program. Use the machine's emergency stopping procedure when an immediate stop is required.

Control	Operator action	Result
Start Hz	Use + / - to set frequency.	With DFR off, the pump runs at this commanded frequency.
START	Press and hold.	Starts the pump; the green START button becomes red STOP.
STOP	Press and hold.	Stops the pump during normal operation.
R	Press and hold the yellow button.	Commands reverse when permitted by the configuration. Verify that the connected system permits reverse flow.
RESET	Press and hold.	Clears the current total/completion state for the next run. Record the completed quantity first.
Clock / date	Touch the lower-right display.	Returns to Startup. Use STOP to stop the pump before leaving the operating screen.

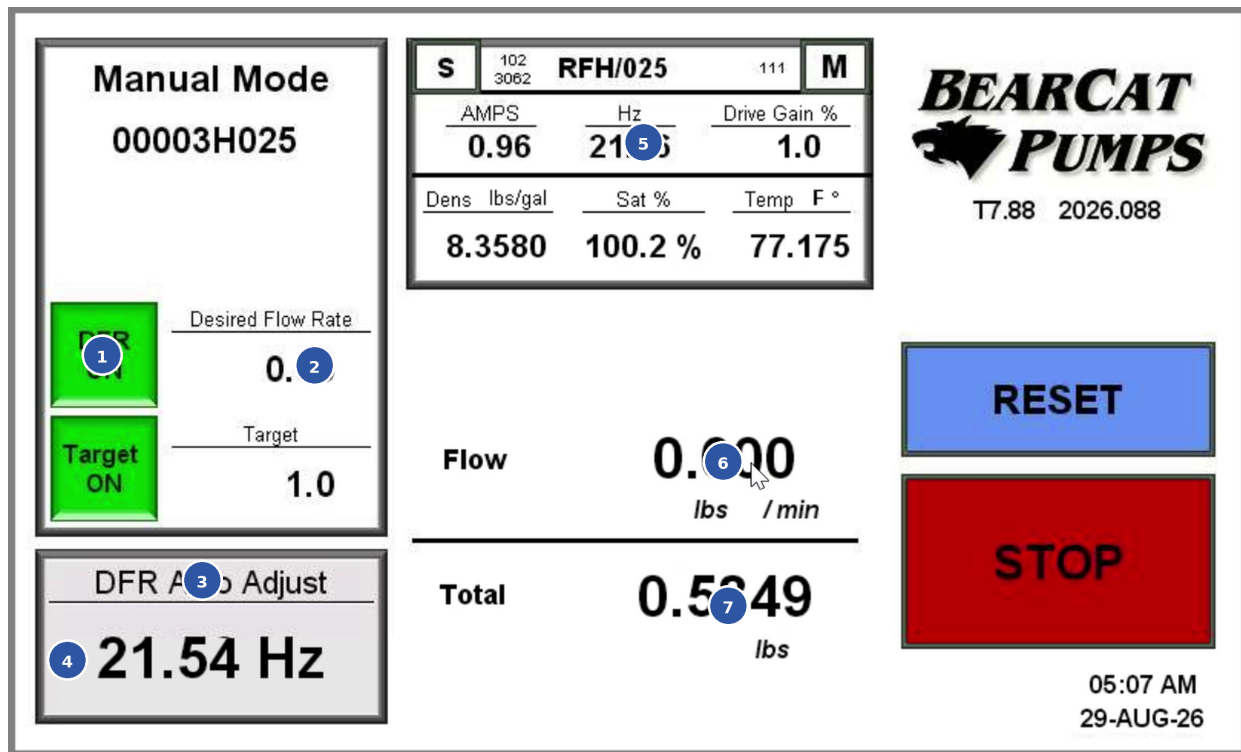
Optional automatic modes

Mode	Operator sets	Controller action
DFR	Desired Flow Rate	Adjusts pump frequency to seek and hold the requested rate.
Target	Stopping total	Slows near the target, stops and reports Load Complete. Reverse occurs only as configured.
DFR + Target	Rate and target total	Regulates flow, then hands control to target slowdown and stopping.

For normal shutdown, hold STOP, confirm flow and motion have stopped, then follow the machine's shutdown procedure. Use lockout and verified isolation before inspection or service.

Desired Flow Rate operation

DFR replaces fixed-frequency control with automatic flow regulation. The example requests 0.60 lb/min; the controller has adjusted the drive to hold the measured flow at that rate.



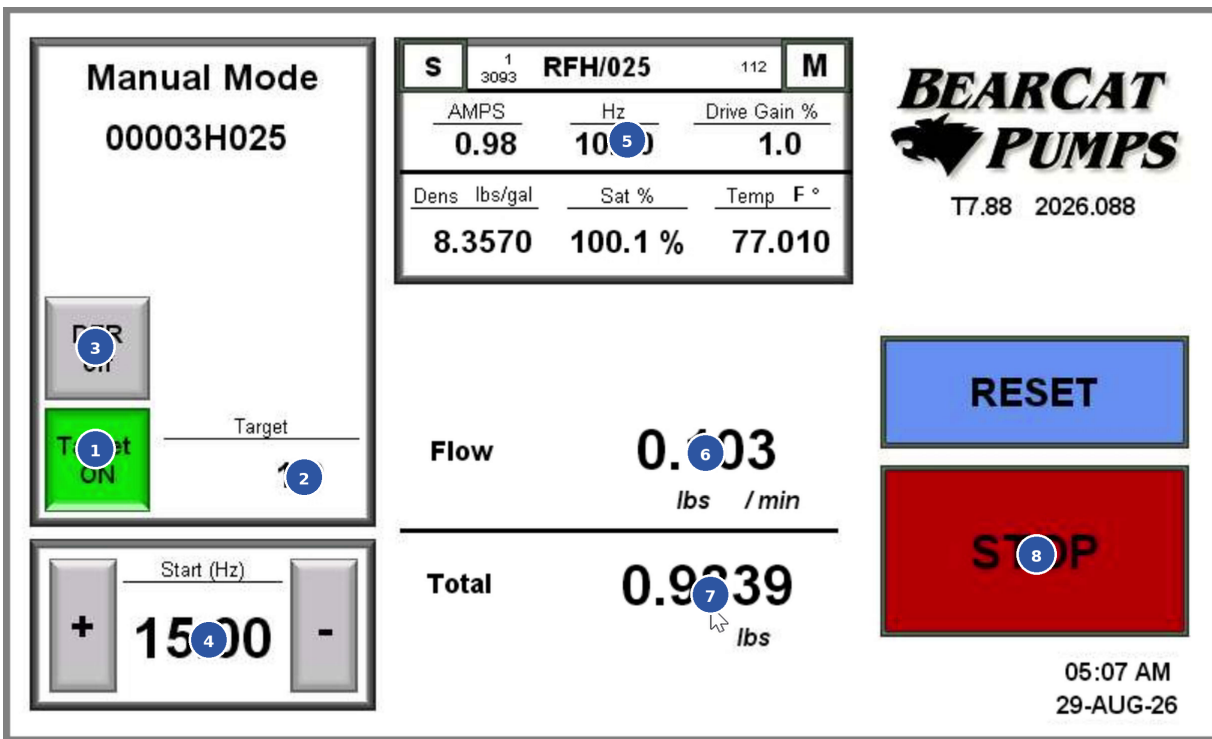
#	Field	Function
1	DFR ON	Enables regulation; touch again to return to fixed-frequency operation.
2	Desired Flow Rate	Flow request in the displayed units; this example is 0.60 lb/min.
3	DFR Auto Adjust	The initial starting-speed hold has ended; correction is active.
4	Adjustment direction	+ raises frequency; - lowers it to seek the requested rate.
5	Hz feedback	Actual drive frequency, adjusted as process conditions change.
6	Flow	Measured rate. Compare with Desired Flow Rate to judge regulation.
7	Total	Accumulated delivered quantity.

AFTER DFR IS ENABLED

In the documented program, the scaled starting frequency is held for approximately 15 seconds. Auto Adjust then appears and frequency changes as needed. Compare the requested rate with the actual measured flow.

Target operation

Target stops a load at a commanded total. This example approaches a 1.0 lb target: DFR has handed control back and the pump is running at the configured slowdown speed.



#	Field	Function
1	Target ON	Enables automatic stopping at the commanded accumulated total.
2	Target	Stopping quantity in the displayed total units.
3	DFR handoff	DFR turns off near the target so target slowdown controls the final approach.
4	Start Hz	Normal fixed-frequency start value retained for manual operation.
5	Hz feedback	Actual drive frequency; this example slows from 15.00 Hz to 10.00 Hz.
6	Flow	Measured rate during the controlled approach.
7	Total	Accumulated quantity compared with the target.
8	STOP / completion	Stops, may perform the configured reverse, then reports Load Complete and waits for RESET.

BEFORE THE NEXT LOAD

Confirm and record the actual delivered total before RESET. Slowdown and early-stop settings account for material already moving; they are not a guarantee of exact delivery. Protected field definitions are in [Section 5.3](#).

Meter Data

From Manual Mode, touch M and enter the authorized passcode. Meter Data contains meter settings, communications readings and mode selection. Opening an edit menu turns editable values blue; black values are read-only.

Main - Parameters (1)

Meter Type: **McrMo**

Units (2): **lbs** Time: **/ min**

DA1i (OUT): **1.50** AD1i (IN): **0.00**

DA2i (OUT): **0.00** AD2i (IN): **0.00**

Flow@60Hz: **1.8** Max Allowed: **1.7** Hi HZ: **7.5**

(3) e **Scale System**

RFH/025 (4) 0

Tube (Hz)	Drive G (%)	LPO (V)	RPO (V)
212.749	1.01	0.7226	0.7215
Live Zero	Full Tube	CT (F)	
0.00017	999.90	77.40	
Temp (C)	Density (g/L)	CD (lb/gal)	
25.2158	1001.873	8.3458	
Flow (kg/s)	Mass (kg)	Sat (%)	
0.00000	0.4507	100.20	
Cut OFF (kg/sec)	Damp	DT / TC	
0.000600	0.80	4.25	
Mass Fact	Vol Fact	Dens Fact	
1.0000	1.0000	1.0000	
K1	K2	D1	D2
4450.90	4674.71	0.00	1.00
FCF	FT	FD	
39.3790	4.6500	0.000	

Cal (5) a

00003H025

T7.88 : 26.088 (6)

4,000,000 3180 5

Manual ON (7) le

Manual (8)

Screen Setup (9)

Close Edit Menu (10)

06:14 AM
29-AUG-26

#	Field	Function
1	Main Parameters	Meter type, units, time base, analog I/O and scaled-system limits.
2	Blue values	Editable while the corresponding edit menu is open.
3	Save / Scale System	Save stores Main Parameter changes; Scale System establishes the DFR starting-speed relationship.
4	Meter Parameters	Live meter/drive values, cutoff, damping and calibration factors.
5	Cal Data	Calibration data; change only through an authorized procedure.
6	Identity / counters	Configured name, software pair and changing communication counters.
7	Mode	Cycles through operating selections; return to the intended mode.
8	Operating mode	Shows the active mode and its return button.
9	Control Setup	Opens advanced setup (5.2). The example screen labels this button "Screen Setup."
10	Close Edit Menu / Exit	Save changes and close all edit menus. Exit is unavailable while an edit menu remains open.

SAVE, CLOSE, THEN EXIT

In the documented T7.88 / 2026.088 screen, Exit returns to operation and stores a Meter Data screen capture on USB. Install the drive before relying on the capture; see 5.4.

Control Setup (S)

From Manual Mode, touch S and enter the authorized passcode. Blue values are editable, black values are read-only, gray toggles are OFF and blue toggles are ON. Older screens call this page "Screen Setup."

The screenshot shows the 'Control Setup (S)' screen for BearCat Pumps. It features a banner at the top left with the 'BEARCAT PUMPS' logo. The main area is divided into several sections:

- Section 1 (Target Parameters):** Includes fields for (Hz) (10), Targ (S) (0.04), Targ (E+) (0.009), and a TREV OFF toggle.
- Section 2 (Speed / Load / Vac):** A table with three columns: Speed (Max HZ: 57.5, Flow Limit: 1.7, G(+): 1, G(-): 1), Load (Raw Amps: 0.00, Amps20hz: 50.00, Rise: 0.55), and Vac (Raw DF2: 0, Vac Limit: 1,000, Empty Pipe: 0).
- Section 3 (PID):** A table with three columns: P (id) (0.20, Low HZ: 1.00), I (nt) (4.00, Max PV: 100 %), and D (er) (0.40, Filter PID: 10).
- Section 4 (Control toggles):** Includes 'Target RST', 'Y1 Out Freq OFF', 'RESET no log', and 'RESET STOPS PUMP'.
- Section 5 (Outputs / tank level):** Includes 'Tank Level OFF', '(Y3) APP' (0.0050), 'Y3 (ms)' (100), and 'Y3 Total pulses' (198).
- Section 6 (Exit):** An 'Exit' button.

 At the bottom left, there are fields for 'DS540 X5_X6' (0) and 'Drive Gain Max Y2' (80.0). The bottom right shows the time '06:41 AM' and date '29-AUG-26'.

#	Area	Purpose
1	Target parameters	Target slowdown, stopping behavior and optional full reverse after a load.
2	Speed / Load / Vac	Maximum frequency, flow limit, and load/vacuum limits for the configured control. Loading/unloading applications use the term Peak Load.
3	PID	Control-response tuning and limits; normally not adjusted in the field.
4	Control toggles	Application choices for Target reset, Y1 output and RESET behavior.
5	Outputs / tank level	Application-specific tank and Y3 output settings and live pulse data.
6	Exit	Returns to the operating screen after the authorized adjustment.

AUTHORIZED ADJUSTMENTS ONLY

Record the original value and reason for each change. Contact BearCat before changing PID, load/vacuum limits, target or reverse parameters. These controls do not replace the connected equipment's required safeguards.

Protected field reference

Definitions only, not default settings. Available fields depend on the meter, signal type and installed program. BearCat metering systems may use Gear Meters or Micro Motion systems; use the procedure for the installed meter.

Meter and analog terms

Field	Meaning	Before changing
Factor / Fact	Correction multiplier applied to the meter calculation.	Use a documented calibration result.
Density / Dens	Material density used to convert between volume and mass.	Confirm units and the material-temperature basis.
ppR	Pulses per revolution for encoder/rotation feedback.	Match the pulse source and mechanical relationship.
ppG	Pulses per gallon for pulse-input volume scaling.	Use that meter's calibration record.
Rate / Total	Whether an analog quantity represents rate or accumulated total.	Match the sending device and active application.
Max	Maximum engineering value represented by the analog input span.	Verify the electrical span and displayed units.

Target approach terms

Current / earlier label	Function	Effect
(Hz) / F	Slowdown frequency for the final approach.	Lower frequency reduces delivery rate near the target.
Targ (S) / S	Quantity before the target where slowdown begins.	Larger values start slowdown earlier.
Targ (E+) / S(+)	Early-stop offset for material already moving.	STOP is commanded before the target by this quantity.

CALIBRATION BOUNDARY

This page is not a calibration procedure. Use the approved meter-specific instruction or contact BearCat. Record the original value, units, software pair and reason for every authorized change.

USB records and logging

The active mode and configuration determine what is recorded. RESET, Exit and automatic logging do not create the same record in every mode.

Trigger	Documented behavior	Operator check
Meter Data: close edits, then Exit	Saves a screen capture of Meter Data.	Close all edit menus, touch Exit and check for a USB-missing indication.
Tank Dose: RESET after the dose	Saves entered load fields, requested target and actual total.	Retain the USB record with the load documentation.
Drum Mode: automatic logging, when enabled	Saves operating information at the configured interval.	Confirm logging is enabled and the drive is installed before the run.
Manual or another mode: RESET	Requests a record only when Log with Reset is configured; contents depend on the program.	Do not treat RESET alone as proof that a file was created.
USB drive missing	The requested file cannot be stored on an absent drive.	A missing-drive indicator or code 40,000,000 identifies the condition in the documented program.

Before relying on a record

1. Install the USB drive before the run.
2. Correct the HMI clock before creating timestamped records.
3. Complete the trigger required by the active mode.
4. Confirm no USB-missing indication remains and verify the required file was saved.
5. Remove the drive only when no record action is active.

NO DRIVE, NO FILE

Confirm the drive and record trigger before the work begins. Do not assume a record requested without the drive will be saved later.

Service record and revisions

SEND PHOTOS BEFORE CALLING

Send wide, well-lit, high-resolution views of the complete installation from several angles: pump, drive, piping, valve positions, controls and surroundings. Add a clear HMI-screen photo and relevant PLC/drive indicators. BearCat can zoom in but cannot zoom out.

Capture	Include
Equipment identity	Cabinet model/serial and configured machine name.
Software pair	Exact HMI and PLC values, including leading zeros and punctuation.
Behavior and readings	Complete message/error number, what still works, when the condition occurs, and relevant flow, total, frequency and meter-health readings.
Recent work	Power interruption, cable movement, program/parameter changes or replaced equipment.

Support: 623-587-1350 | [T7 documents and training](#)

Revision history

Rev	Date	Change
A-C	2026-09-01 / 02	Initial edition; Manual Mode, DFR, Target and Meter Data added.
D-E	2026-09-02	Organized operator workflow, protected setup and annotated screens.
F-G	2026-09-02	Added Tank Dose, Drum Mode and Meter Only addendums.
H	2026-09-03	Added protected-field definitions, USB guidance and earlier mode names.
I	2026-09-20	Added the clean T7 panel cover drawing.
J	2026-09-21	Applied current project rules: Control Setup terminology, unpadded steps, restrained callouts, safety and service-photo guidance. Removed the troubleshooting chapter; retained operating screens and mode instructions.

Technical basis: Rev I operating content and retained screens (T7.87 / 2026.087; T7.88 / 2026.088). Rev J is an editorial and safety-guidance update; it does not change the control program.

Application-specific modes

Use an addendum only when its mode and described functions are configured on the installed control. The core startup, operating and protected-setup instructions remain applicable. Recipe Mode has a separate operator manual.

Read the applicable core instructions first

Topic	Read first	Why it applies
Startup	3.1-3.2	Identity, software pair and mode selection.
Manual operation	4.1-4.4	Feedback, machine controls, DFR and Target where fitted.
Protected setup	5.1-5.4	Editing, field definitions and USB behavior.
Service information	6	Photos, identity, software values and operating evidence.

Mode addendums

Addendum	Mode	Application
M-01	Tank Dose	Calculates a dose target from tank load and ratio.
M-02	Drum Mode	Regulates additive flow from plant asphalt-cement flow and ratio.
M-03	Meter Only Mode	Measurement, health and target-stop output without VFD control.

Earlier mode names

Earlier label	Starting point	Applicability
Manual Control	Manual Mode	See 4.1-4.4 ; confirm the configured fields.
Drum Feed	Drum Mode	Use M-02 only when the installed button and program match.
Terminal Feed	Compare with Tank Dose	Similar ratio/target workflow does not establish equivalence. Verify fields and software pair.
Batch Feed	Program-specific	Use the machine-specific instructions.

Tank Dose

For controls configured with Tank Dose. Read Sections 3-5 first; this addendum covers the dose fields and recording behavior.

Tanl¹Dose

Load Name
D²'1

Type Ratio %
A³'1 **0.4**

Tank Load lbs
6,500.0

Target
0.00

Start (Hz)
+ 25.00 -

S	112 3006	RFH/025	111	M
AMPS	Hz	Drive Gain %		
0.98	25.00	1.0		
Dens lbs/gal	Sat %	Temp F °		
8.3660	100.3 %	77.158		

Flow **0.232**
 lbs / min

Total **0.9943**
 lbs

T7.88 2026.088

LAS P1

RE⁸SET

STOP

08:19 AM
29-AUG-26

#	Field	Function
1	Tank Dose	Confirms the active mode.
2	Load Name	Driver, invoice, load or other identifying name stored with the record.
3	Type	Product being dosed.
4	Ratio %	Requested product percentage; changing it recalculates Target.
5	Tank Load	Total tank or truck load used as the calculation basis.
6	Target	Tank Load x Ratio. Example: 6,000 lb x 0.50% = 30.00 lb.
7	Start Hz	Frequency; use + / - or touch the value for direct entry.
8	RESET / record	After the dose, RESET saves the entered fields, target and actual total to USB.

CHECK THE REQUEST, THEN SAVE THE RESULT

Confirm load identity, product, units, tank load and ratio before START. After dosing, compare the actual total with the requested target. Install the USB drive before using RESET to create the record.

Drum Mode

For controls configured with Drum Mode. Read Sections 3-5 first. The control calculates additive flow from plant asphalt-cement (AC) flow and the entered ratio.

Drum (1)

Load Name: **A21** (2)

Type: **A31** (3) Ratio %: **0.4** (4)

AC Flow: **310.6** (5) lbs / min

Desired Flow Rate: **0.621** (6)

Auto Adjust: **+ 22.81 Hz** (7)

S	10 2994	RFH/025	101	M
AMPS	Hz	Drive Gain %		
0.97	22.81	1.0		
Dens lbs/gal	Sat %	Temp F °		
8.3623	100.2 %	77.302		

BEARCAT PUMPS
T7.88 2026.088

LAS P1

RESET

STOP

Flow: **0.606** lbs / min

Total: **1.5095** lbs

08:29 AM
29-AUG-26

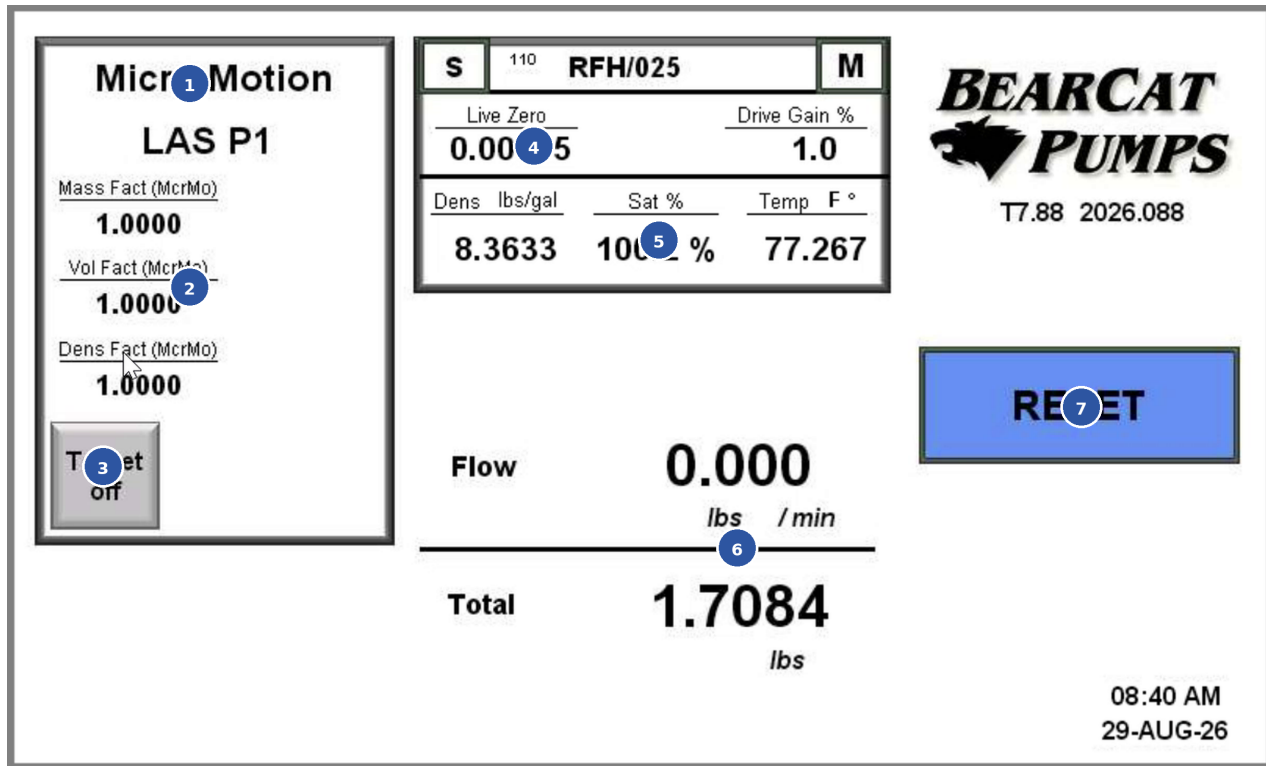
#	Field	Function
1	Drum	Confirms the active mode.
2	Load Name	Load or product identifier stored with the USB record.
3	Type	Additive being pumped; commonly liquid anti-strip.
4	Ratio %	Requested additive percentage relative to plant AC flow.
5	AC Flow	Plant asphalt-cement flow from a 4-20 mA signal or another flow meter.
6	Desired Flow Rate	AC Flow x Ratio. Example: 310.6 lb/min x 0.20% = 0.621 lb/min (rounded).
7	Auto Adjust / Hz	After the approximately 15-second initial hold, speed adjusts to match actual flow to the calculated rate.

THE DOSE FOLLOWS THE PLANT

As AC flow changes, Drum Mode recalculates DFR and adjusts speed. Confirm the AC input, units and ratio before operation. Periodic USB records require logging to be enabled; see 5.4.

Meter Only Mode

For controls configured for Meter Only operation. Read Sections 3-5 first. This example uses a Micro Motion system and a discrete target-stop output to external equipment.



#	Field	Function
1	Micro Motion / name	Identifies the configured meter-only system.
2	Meter factors	Mass, volume and density factors used in meter measurement.
3	Target	Enables a target total. The PLC can signal another device to initiate stopping.
4	Live Zero	Micro Motion zero-stability value for condition monitoring.
5	Meter health	Drive gain, density, saturation and temperature replace drive-related fields.
6	Flow / Total	Measured flow and accumulated quantity in the configured units.
7	RESET	Clears the current total or completed target state as configured.

EXTERNAL STOPPING EQUIPMENT

START/STOP, reverse and frequency controls are absent because this mode does not command a VFD. Confirm the receiving device and its stopping function before relying on the target output.