

# GS2800

## HIGH SPEED BATCH CONTROLLER

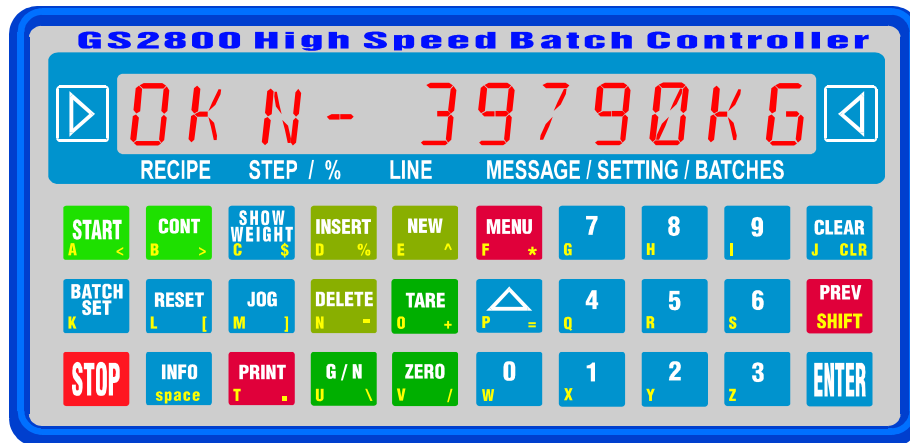


**High Performance multi ingredient multi recipe  
Batch Controller offering an extensive range of  
Reporting and Batch Logging functions.**

**GS<sup>®</sup> GEDGE SYSTEMS**

**DESIGNED & MANUFACTURED in AUSTRALIA**

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Tel +61 3 9429 8396; Fax +61 3 9429 8097; email [info@gedgesystems.com.au](mailto:info@gedgesystems.com.au)



- **Versatile & Easy to Use.** Easily Programmed and Setup by the User with Conversational type Menus and Messages.
- **Quality Assured.** Internal Self Checking & Extensive Batching Log recording of EVERY Batching operation.
- **Materials Management.** Provides Printed and Displayed Materials and Recipe Usage Reports.
- **Fail--safe.** Dual Hardware Watchdog circuits Continually Monitor CPU and Output Line Functions.
- **Security.** Two levels of access Security -- Remote Key Input and Password Number. Battery Backup of ALL settings is standard with extensive data integrity self checking.
- **Full Function Front Panel.** Full function audio feedback Sealed Membrane Keyboard for ALL Programming, Setup AND Batching. Remote Batch Control Inputs standard.
- **32 User Programmable Lines.** Twelve "real output" Lines for Feeders and Control. Twenty "dummy" Lines for internal batching control functions.
- **20 Recipes.** Storage for 20 Recipes of 32 Process steps Each. Unlimited Recipe Capacity if a Computer is used to download Recipes.
- **Powerful & Flexible.** One unit Replaces Weight Indicators, Logic Circuits, PLC's and Computers in most Batching Applications.
- **Year 2000 Compliant.** All functions including date printing and entry are fully year 2000 compliant.

## INTRODUCTION & DESCRIPTION.

The GS2800 is a microprocessor based weight and volume batching system combining all the control and measuring elements needed to carry out a complete materials batching process.

The user friendly GS2800 includes an easy to understand menu system for selection of all its main functions. All settings entered into the GS2800 are automatically checked by the GS2800 to ensure that they are correct. In the event that an incorrect entry is made, the GS2800 alerts the operator by displaying an easy to understand message which includes the allowed response.

The GS2800 has been designed to completely eliminate the need for external control elements such as PLCs, Computers and logic circuits, in the majority of batching situations. Provided within the standard GS2800 are all the control, reporting, accumulating and measuring functions that have in the past required several instruments to achieve. The GS2800 will frequently be the only control instrument required in a batching process.

The GS2800 has been designed to be used to control multi ingredient batching processes in the production of foodstuffs, confectionery, concrete, road materials, beverages, glass, plastics, chemicals, animal feed and virtually any production process requiring multi component batching.

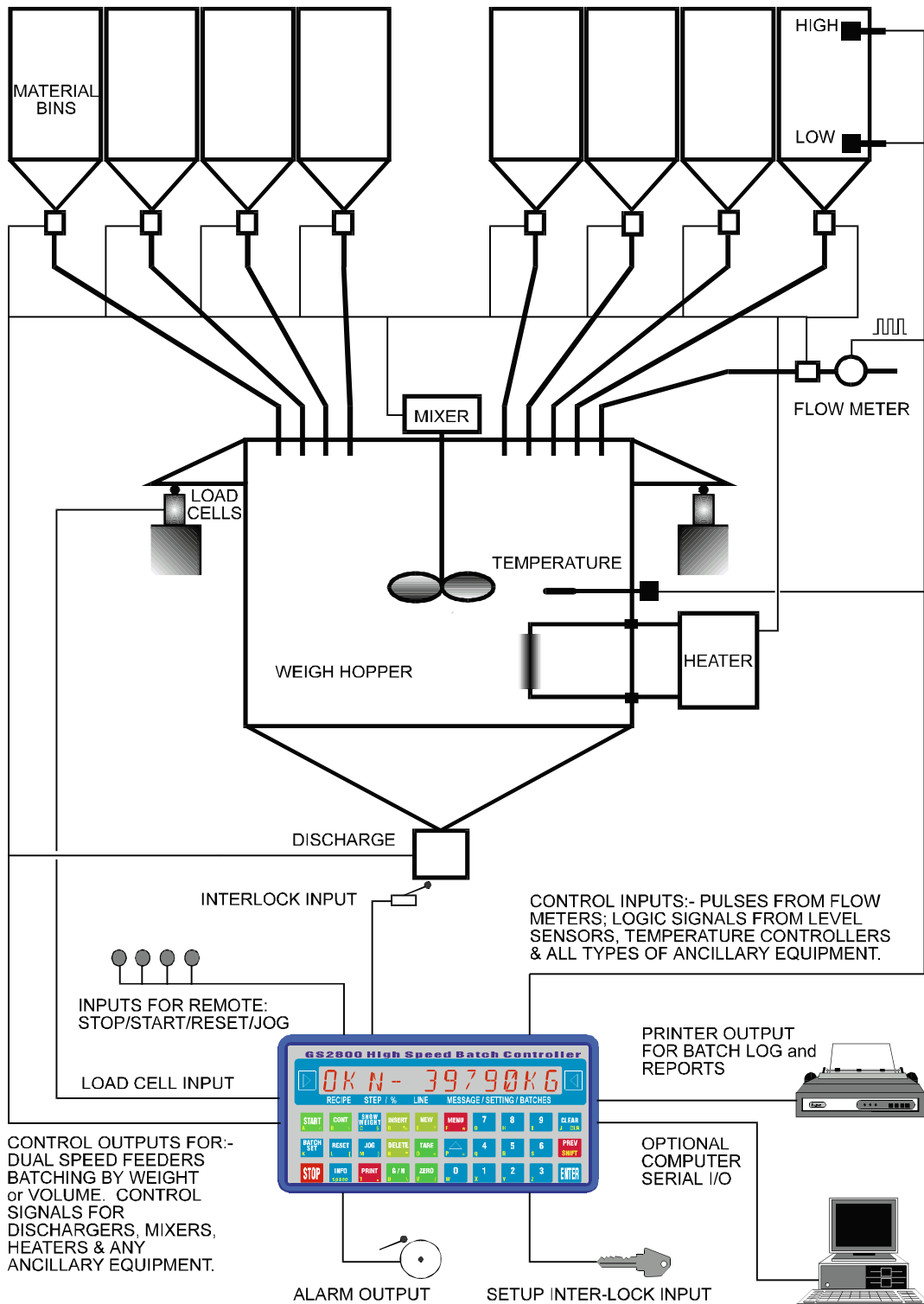
The **STANDARD** GS2800 comprises the following main items in one small rugged enclosure:

- A sealed membrane front panel keyboard of 32 keys together with a 12 character alpha/numeric display. The GS2800's front panel can be used for ALL programming and setup functions. In addition, the front panel can be used to control the entire batching process. No additional or external keyboards or programming devices are required.
- An extensive "security system" comprising a selectable password facility and an isolated input for the remote connection of a key switch. The password and key switch are used to selectively control access to the GS2800's settings.
- Four isolated inputs for connection to remote push buttons which may be used (in addition to the front panel controls) to control the GS2800's batching operation.
- Four isolated inputs for the GS2800 to receive remote logic signals which may be used by the GS2800 during batching.
- An input line capable of receiving pulses at a rate of 1 pulse per 10 hours to 78 pulses per second. This input is used by the GS2800 to batch material by volume using the pulsed (cyclic) output from flow meters. The GS2800's pulse input line can also be used to count logic operations rather than flow pulses.
- A very high stability, 7.5ppm/°C, weight converter "front end" operating at 100 samples per second for the ultimate in high speed batching. The GS2800 also includes automatic switching between fast and slow update rates to achieve the best balance between batching speed and accurate tolerance checking.
- Battery supported memory for all the GS2800's settings together with extensive data integrity checking routines. Storage includes 20 Recipes each of 32 process steps as well as Material and Recipe usage by weight and quantity to 9 active digits. The GS2800's memory is always checked for accuracy at power up and prior to batching. All memory errors are reported to the operator.
- A battery backed time and date facility for the inclusion of Time and Date on all reports and Batch Logs. In addition, each Recipe Step printed on the Batch Log also includes the time the step was completed.
- An optically isolated RS-232C serial output card with an isolated "printer ready" input signal line. The printer output is used to print all the GS2800's reports and logs. Printed reports and logs include:
  - A Batch Log describing every step of the batching process, including all material weights, all "out of tolerance" conditions and all error messages. The GS2800 also prints on the Batch Log the Operator's response to all "out of tolerance" conditions and to all error messages.
  - A Recipe report which includes all details of the selected Recipe together with any error messages which may apply to the Recipe's settings.Reports containing details of all the GS2800's set up settings. These reports are: Line Setup Report, System Setup Report and Weigher Setup Report. These reports are important security and service/maintenance records of all the GS2800's settings. Any changes to the GS2800's settings are quickly identified by comparing reports.
- Reports of Materials Usage by Weight and Volume and Recipe Usage by weight. The reports also include the Time and Date when the accumulated usage information was last cleared.

- Twelve (12) optically isolated output lines which are programmed on installation of the GS2800 to control logic outputs, material feeders or flow controls. These lines are used by the GS2800 for the complete control of the batching process. Processes which can be controlled include operation of multiple speed material feeders, dischargers, mixers, heaters, alarms, flow controls and any other control element in a batching process. Bank switching techniques using 2 bank select lines and 7 materials lines allows the control of up to 28 individual materials.
- Twenty (20) internal function lines programmed on installation to operate internal timers, external printers, the GS2800's front panel display, internal functions and to count external pulses. These lines control the batching process by using commands inserted in a Recipe which then control printers, internal timers, internal counters, front panel messages and internal functions.

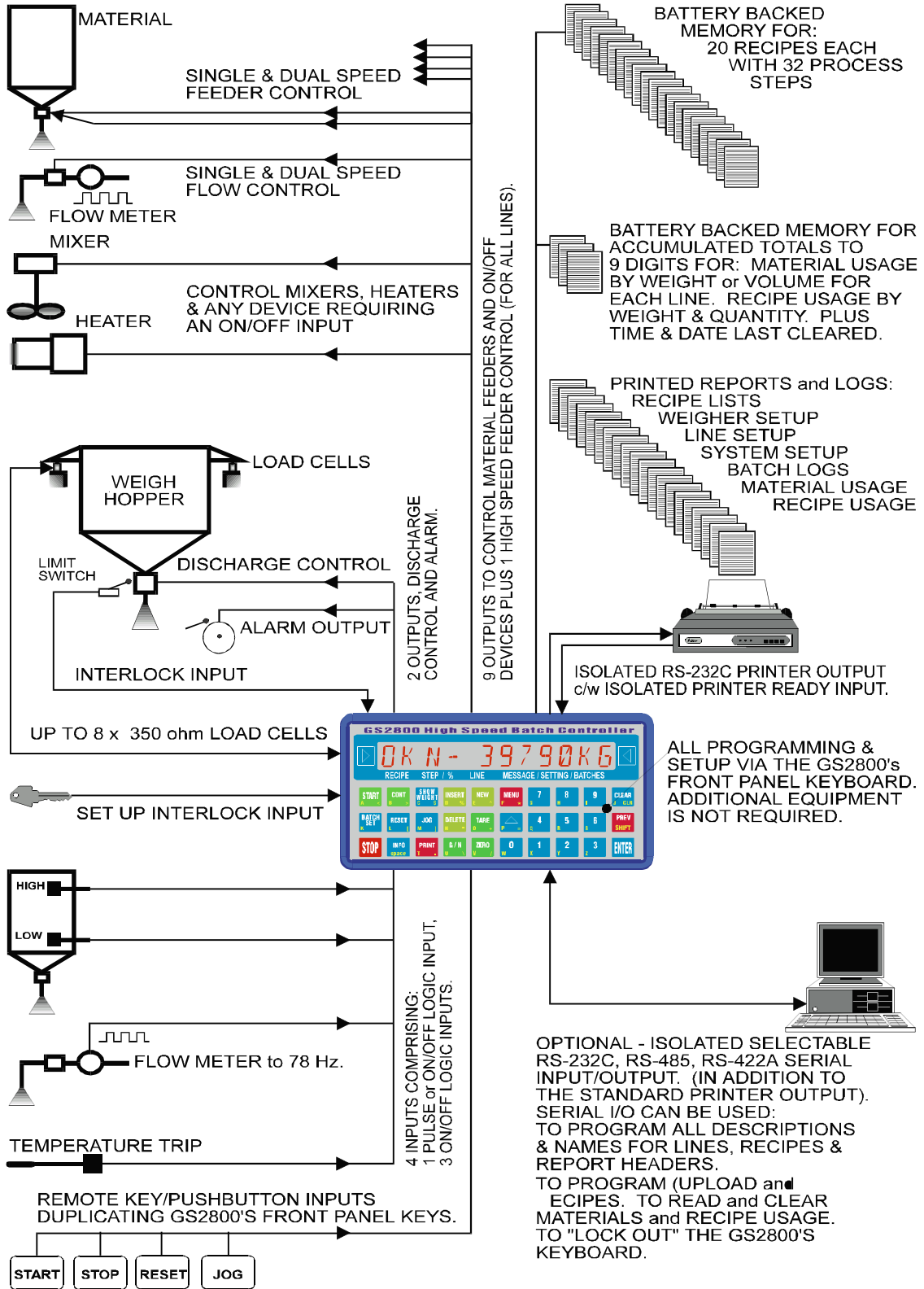
# Typical System

The GS2800 will be the ONLY Control element required in most batching Systems. The GS2800 Batches Material by Weight & Volume using Single & Dual Speed Feeders; Controls Mixers, Heaters, Valves, Lamps, Alarms & Any Logic Controlled Devices; Includes Timers, Functions, Printer Controls, Counters & Logic Tests; Prints Reports of ALL its Settings and Prints EXTENSIVE Batch Log Reports.



# Capacities

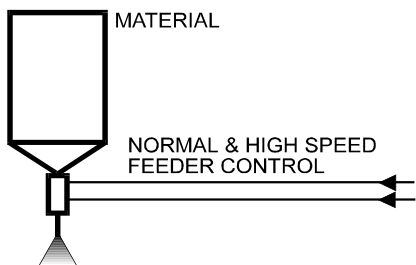
The GS2800 controls Material Feeders, Dischargers, Alarms and ON/OFF Devices with its 12 Isolated Output Lines. The GS2800's 10 Isolated Input Lines are used for Logic Tests, Pulse Inputs, Interlock Inputs and Remote Key Functions. The GS2800 Prints Reports via its STANDARD Isolated Printer Output with Time & Date. The GS2800 Stores, Displays & Prints Accumulated Material and Recipe Usage Information for its 20 Recipes and 32 Lines.



# Line Settings

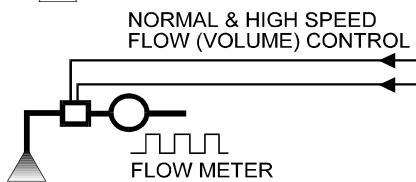
The GS2800's 32 Internal & External Output Lines are Programmed to Batch by Weight or Volume, to Control ON/OFF Input Devices, to Control a Printer, to carry out Functions, display messages and act as Timers. The GS2800 stores Recipes used for Batching and Accumulates Materials Usage by Weight & Volume and Recipe Usage by Quantity and Weight.

## SETTINGS FOR EACH OF THE GS2800's 12 EXTERNAL OUTPUT LINES



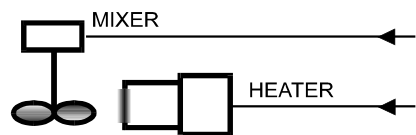
### MATERIAL LINES BATCHED BY WEIGHT 1 to 9.

INDIVIDUAL SETTINGS FOR EACH LINE:  
20 CHARACTER DESCRIPTION, BATCH INTO or OUT OF A WEIGH HOPPER, BATCH BY NET or GROSS WEIGHT, IN FLIGHT COMPENSATION (AUTOMATICALLY ADJUSTED), AUTOMATIC IN FLIGHT COMPENSATION LIMIT, HIGH SPEED FEEDER CUT OFF, DISPLAY WEIGHT TO TARGET or A MESSAGE WHILE FEEDING, MESSAGE TO DISPLAY WHILE FEEDING, TIME OUT ALARM PERIOD and JOG TIME FOR EACH AUTOMATIC and MANUAL JOG CYCLE.



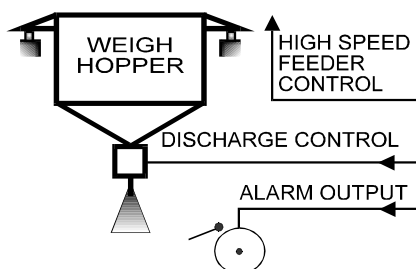
### MATERIAL LINES BATCHED BY VOLUME 1 to 9.

INDIVIDUAL SETTINGS FOR EACH LINE:  
20 CHARACTER DESCRIPTION, IN FLIGHT COMPENSATION VOLUME (AUTOMATICALLY ADJUSTED), AUTOMATIC IN FLIGHT COMPENSATION LIMIT (VOL), HIGH SPEED FEEDER CUT OFF (VOL), DISPLAY VOLUME TO TARGET or A MESSAGE WHILE FEEDING, MESSAGE TO DISPLAY WHILE FEEDING, TIME OUT ALARM PERIOD and JOG TIME FOR EACH AUTOMATIC and MANUAL JOG CYCLE.



### CONTROL LINES 1 to 9

INDIVIDUAL SETTINGS FOR EACH LINE ARE:  
20 CHARACTER DESCRIPTION, DISPLAY CONTROL CODE or A MESSAGE WHILE BATCHING, MESSAGE TO DISPLAY WHILE BATCHING & TIME OUT ALARM PERIOD.



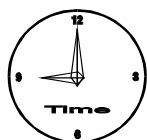
### DISCHARGE, HIGH SPEED FEEDER and ALARM LINES 10, 11 & 12

INDIVIDUAL SETTINGS FOR EACH LINE ARE:  
20 CHARACTER DESCRIPTION, MESSAGE DISPLAYED WHILE BATCHING (Discharge only), & TIME OUT ALARM PERIOD (Discharge only)

## SETTINGS FOR EACH OF THE GS2800's 20 INTERNAL (OUTPUT) LINES

INDIVIDUAL SETTINGS FOR EACH LINE ARE: 20 CHARACTER DESCRIPTION, DISPLAY TIME REMAINING or A MESSAGE WHEN BATCHING, DISPLAY COUNTS REMAINING, or A MESSAGE WHEN BATCHING, MESSAGE TO DISPLAY WHEN BATCHING & TIME OUT ALARM PERIOD.

ANY OF THE 20 INTERNAL LINES CAN BE SET UP AS:



**TIMER**  
Time delay.

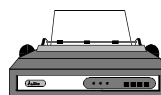


**COUNTER**  
Counting logic pulses.

**"MESSAGE"**



**MESSAGE DISPLAY**  
Operator prompt, wait CONTINUE key.



**PRINT CONTROLLER**  
Control the Printer when printing a Batch Log.

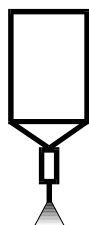


**FUNCTION**  
Add Net or Gross weight to a particular memory in addition to the GS2800's normal automatic weight accumulation. Acquire Tare, switch to Gross or Net and change the operation of the START keys.

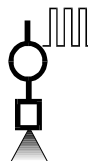
# Recipe Settings

The GS2800 Batches Material by Processing one of its 20 Recipes containing up to 32 process Steps per Recipe. Each process Step "calls up" one of the GS2800's 32 Lines and includes Target settings for Weight & Volume; High & Low Tolerances; Control, Printer, Function and Discharge Codes; Logic Counts, messages and Time Delays.

## RECIPE SETTINGS FOR EACH OF THE GS2800's LINE TYPES



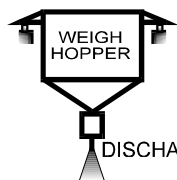
FOR LINES SET UP TO BATCH MATERIAL BY WEIGHT: TARGET WEIGHT, HIGH TOLERANCE (WEIGHT), LOW TOLERANCE (WEIGHT). NOTE:- THE TARGET WEIGHT SETTING CAN BE PROPORTIONED 1% TO 100% WHEN BATCHING.



FOR LINES SET UP TO BATCH MATERIAL BY VOLUME: TARGET COUNTS (PULSES FROM A FLOW METER), HIGH TOLERANCE (COUNTS), LOW TOLERANCE (COUNTS). NOTE:- THE TARGET VOLUME SETTING CAN BE PROPORTIONED 1% TO 100% WHEN BATCHING.



FOR LINES SET UP AS CONTROL LINES: CONTROL CODE (SELECTED FROM A LIST OF 66 CODES). CODES INCLUDE UNCONDITIONAL ON/OFF TO WAIT FOR A PARTICULAR STATUS ON ANY COMBINATION OF THE GS2800's 4 INPUT LINES.



FOR THE DISCHARGE LINE: CONTROL CODE TO DISCHARGE FOR A PRESET TIME OR DISCHARGE UNTIL THE WEIGH HOPPER IS EMPTY.



FOR THE HIGH SPEED FEEDER and ALARM LINE: NO SETTINGS ARE REQUIRED. OPERATION OF THESE LINES IS FULLY AUTOMATIC.



ALARM



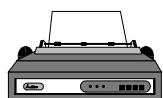
FOR LINES SET UP AS TIMERS: REQUIRED TIME DELAY FROM 1 SECOND TO 36,000 SECONDS.



FOR LINES SETUP AS LOGIC COUNTERS: REQUIRED NUMBER OF LOGIC PULSES FROM 1 TO 50,000. NOTE:- LOGIC COUNTING LINES ARE NOT PROPORTIONED WHEN BATCHING.



FOR LINES SETUP AS MESSAGE LINES: NO SETTINGS ARE REQUIRED. ALL SETTINGS ARE AUTOMATICALLY SET.



FOR LINES SETUP AS PRINT CONTROLLERS: PRINT CONTROL CODE FROM A LIST OF CODES IN THE MANUAL. CODES PROVIDED INCLUDE: TURN THE BATCH LOG ON/OFF, LOG ALL OPERATIONS OR ONLY EXCEPTIONS, EJECT THE BATCH LOG FROM THE PRINTER.



FOR LINES SETUP AS FUNCTION CONTROLS: FUNCTION CODE FROM A LIST OF CODES IN THE MANUAL. CODES PROVIDED INCLUDE TOTALISING NET OR GROSS WEIGHTS, SWITCHING FROM NET TO GROSS & GROSS TO NET, ACQUIRING TARE & CHANGING OPERATION OF THE START KEY. THE ACCUMULATION OF WEIGHTS FUNCTION IS IN ADDITION TO THE GS2800's AUTOMATIC WEIGHT & VOLUME ACCUMULATION WHILE BATCHING.

# Reports

## REPORTS and LOGS

The GS2800 provides extensive reports of EVERY set up and every installation setting. In addition, the GS2800 provides a detailed Batch Log recording every process step, every exception and every operator response.

These reports are invaluable to organisations seeking quality standard certification or concerned to have available documentary records of the plant's actual production. The reports will also be found indispensable by personnel responsible for the service, installation and commissioning of the GS2800 as they will form a permanent record of the GS2800's calibration and setup.

<p>Gedge Systems -- Melbourne -- Australia                  High Speed Batch Controller                  GS2800 S/No 34567 version 1:01 No 01 Capacity 30.00kg by 0.01kg                  09/09/1997 16:04:08</p> <p><b>WEIGHER SETUP and CALIBRATION SETTINGS</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Capacity, divisions x 100</td><td style="text-align: right;">30</td></tr> <tr><td>Count By</td><td style="text-align: right;">1</td></tr> <tr><td>Decimal Places</td><td style="text-align: right;">2</td></tr> <tr><td>Dummy Zero</td><td style="text-align: right;">off</td></tr> <tr><td>Overweight, dd or percent</td><td style="text-align: right;">9</td></tr> <tr><td>Zero Track Band, dd</td><td style="text-align: right;">off</td></tr> <tr><td>Motion Band, dd</td><td style="text-align: right;">8</td></tr> <tr><td>Update Rate/second</td><td style="text-align: right;">100</td></tr> <tr><td>Alternative Update Rate/Sec</td><td style="text-align: right;">6</td></tr> <tr><td>Units of Weight</td><td style="text-align: right;">kg</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>GS2800 Weigher Number</td><td style="text-align: right;">01</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>Approximate Span Input, mv</td><td style="text-align: right;">12</td></tr> <tr><td>Approximate Deadload, mv</td><td style="text-align: right;">8</td></tr> </table>	Capacity, divisions x 100	30	Count By	1	Decimal Places	2	Dummy Zero	off	Overweight, dd or percent	9	Zero Track Band, dd	off	Motion Band, dd	8	Update Rate/second	100	Alternative Update Rate/Sec	6	Units of Weight	kg			GS2800 Weigher Number	01			Approximate Span Input, mv	12	Approximate Deadload, mv	8	<p style="text-align: right;"><b><i>Weight Calibration &amp; Setup Report</i></b></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Every GS2800 Report includes a page heading comprising:--</p> <p>User programmable "personalised" Company Header of 2 lines each of 40 characters.</p> <p>The GS2800's Model number, Serial Number and Program Version number. These settings are factory programmed and cannot be changed.</p> <p>The GS2800 Weigher Number used in Serial Communications plus the Actual Calibrated Weight set up of the GS2800 including the Capacity of the weigh hopper and the smallest weight increment. This setting changes automatically whenever the GS2800's Calibration is changed.</p> </div>
Capacity, divisions x 100	30																														
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<p>Gedge Systems -- Melbourne -- Australia                  High Speed Batch Controller                  GS2800 S/No 34567 version 1:01 No 01 Capacity 30.00kg by 0.01kg                  09/09/1997 16:14:02</p> <p><b>SYSTEMS SETTINGS</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>ss01 Zero Tolerance</td><td style="text-align: right;">0.02</td></tr> <tr><td>ss02 Discharger Interlock</td><td style="text-align: right;">on</td></tr> <tr><td>ss03 Input Pulse Divider</td><td style="text-align: right;">1</td></tr> <tr><td>ss04 Max Number of Jogs</td><td style="text-align: right;">3</td></tr> <tr><td>ss05 Settling Time Secs.</td><td style="text-align: right;">1</td></tr> <tr><td>ss06 Settling Time Wt.</td><td style="text-align: right;">0.02</td></tr> <tr><td>ss07 Settling Time Limit</td><td style="text-align: right;">5</td></tr> <tr><td>ss08 Start Motion Rate</td><td style="text-align: right;">0.04</td></tr> <tr><td>ss09 New Page/Report</td><td style="text-align: right;">on</td></tr> <tr><td>ss10 New Page/Batch Log</td><td style="text-align: right;">on</td></tr> <tr><td>ss11 Power Fail Alarm</td><td style="text-align: right;">on</td></tr> <tr><td>ss12 Batch Log On/Off</td><td style="text-align: right;">on</td></tr> <tr><td>ss13 Keyboard Buzzer</td><td style="text-align: right;">on</td></tr> <tr><td>ss14 Password Number1</td><td style="text-align: right;">67895</td></tr> </table> <p><b>CODE/TIME/COUNT LIMITS</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Control Code, max</td><td style="text-align: right;">C66</td></tr> <tr><td>Discharge Code, max</td><td style="text-align: right;">D11</td></tr> <tr><td>Printer Code, max</td><td style="text-align: right;">P21</td></tr> <tr><td>Function Code, max</td><td style="text-align: right;">F11</td></tr> <tr><td>Maximum Time, seconds</td><td style="text-align: right;">36000</td></tr> <tr><td>Maximum Count</td><td style="text-align: right;">50000</td></tr> </table>	ss01 Zero Tolerance	0.02	ss02 Discharger Interlock	on	ss03 Input Pulse Divider	1	ss04 Max Number of Jogs	3	ss05 Settling Time Secs.	1	ss06 Settling Time Wt.	0.02	ss07 Settling Time Limit	5	ss08 Start Motion Rate	0.04	ss09 New Page/Report	on	ss10 New Page/Batch Log	on	ss11 Power Fail Alarm	on	ss12 Batch Log On/Off	on	ss13 Keyboard Buzzer	on	ss14 Password Number1	67895	Control Code, max	C66	Discharge Code, max	D11	Printer Code, max	P21	Function Code, max	F11	Maximum Time, seconds	36000	Maximum Count	50000	<p style="text-align: right;"><b><i>Systems Settings Report</i></b></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Access to the GS2800's Calibration, Setup and Recipe Settings is restricted:</p> <p>Firstly, by the use of the GS2800's remote setup interlock input which limits the range of the menu screens accessible to the user.</p> <p>Secondly, by the use of a programmable Password Number which is then required to change any of the GS2800's settings. As a further safety measure, the GS2800 also reports the number of failed attempts to enter the Password.</p> </div>
ss01 Zero Tolerance	0.02																																								
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## LINE SETUP SETTINGS

TYPE	G/N	IN	ADJUST	HS	DSP	MESS	TIME	JOG	DESCRIPTION	
NO	IN/OUT	FLIGHT	LIMIT	C'OFF			OUT	TIME		
01 M	i	N	0.01	5.00	0.00	d	A#01Z	120	1.2	Product Type A#01Z
02 M	i	N	0.01	2.00	0.00	d	245/A	180	0.4	Product Oils 245/A
03 M	i	N	0.04	2.00	0.25	d	38/NY	170	1.0	Product Type 38/NY
04 M	i	N	0.09	2.00	0.20	d	15ZS	100	1.6	Product Granule 15ZS
05 c	--	2	20	10	d	C2G	210	2.3	Additive C2G, Volume	
06 C	--	0	0	0	m	HEAT	600		Heater Control Line	
07 u	--	0	0	0	d	-----	0		Unused Line	
08 C	--	0	0	0	m	MIXER	600		Mixer Control Line	
09 C	--	0	0	0	m	PURGE	300		Purge Pump Control	
10 D	--	0	0	0	d	DISCH	45		Discharge Control Line	
11 H	--	0	0	0	--	-----	0		High Speed Feed Line	
12 A	--	0	0	0	m	ALARM	0		Alarm Output Line	
13 t	--	0	0	0	m	DISCH	600		Timer -- Discharge	
14 c	--	0	0	0	d	COUNT	600		Logic Pulse Counter	
15 P	--	0	0	0	m	PRINT	5		Batch Log Control	
16 m	--	0	0	0	m	ADD	320		Manual Additive	
17 F	--	0	0	0	m	C2G	2		Weight of C2G	
18 t	--	0	0	0	d	MIXER	640		Mixer ON timer	
19 u	--	0	0	0	m	-----	0		Unused Line	
20 u	--	0	0	0	m	-----	0		Unused Line	
21 u	--	0	0	0	m	-----	0		Unused Line	
22 u	--	0	0	0	m	-----	0		Unused Line	
23 u	--	0	0	0	m	-----	0		Unused Line	
24 c	--	0	0	0	m	-----	0		Unused Line	
25 m	--	0	0	0	m	ADD25	10		Manual Additive #25	
26 P	--	0	0	0	m	-----	0		Unused Line	
27 u	--	0	0	0	m	-----	0		Unused Line	
28 F	--	0	0	0	m	ADDWT	1		Weight Additive #25	
29 u	--	0	0	0	m	-----	0		Unused Line	
30 t	--	0	0	0	m	HEAT	600		Heater ON time	
31 F	--	0	0	0	m	TARE	1		Tare the Hopper	
32 F	--	0	0	0	m	GROSS	1		Switch to Gross	

M material, C control, D discharger, H high speed feeder,  
A alarm, t timer, c count, P print, m message, F function, u unused.  
i/o Batching in/out, G/N Batching Gross/Net  
d data (Weight/Count/Time), m message

The Line setup Report contains all of the settings for each of the GS2800's 32 Lines including a 20 character Description for each line.

The GS2800 lists individual Recipes in a Recipe Report. The report includes the Recipe's Number and Description. In addition, each process Step of the Recipe is listed, including details of the GS2800 Line which is "called up" for that Step.

The GS2800 is designed to simplify the creation of Recipes. While the Recipe report contains a lot of information, most of it is inserted automatically because it relates to the GS2800's Lines "called up" in the Recipe.

The actual entries required to create a Recipe are included in the report. They are brief and comprise: the Target and Tolerance settings for Weight and Volume; the time required time delay for timer Steps and a Control Code for Discharge, Control, Printer or Function Steps.

The GS2800 can produce up to 65,000 batches of a Recipe in one run. The Recipe's Weight and Volume Target settings can be automatically proportioned during batching from 1% to 100% of the Recipe settings.

Gedge Systems -- Melbourne -- Australia							<i>Recipe Report</i>	
High Speed Batch Controller								
GS2800 S/No 34567 version 1:01 No 01 Capacity 30.00kg by 0.01kg								
09/09/1997 16:25:34								
Recipe N0 01 2 Batches at 100% of Material/counter Line Nos 1--9								
Formulation 25A/326M								
STEP NO	LINE NO	BY	TARGET WEIGHT	HIGH TOL	LOW TOL	CODE	TIME COUNT	ERROR LINE NAME CODE
01	15					P01		Batch Log Control
02	01	iN	0.50	0.01	0.01			Product type A#01Z
03	31					F03		Tare the Hopper
04	05			1	1		150c	Additive C2G, Volume
05	17					F09		Weight of C2G
06	04	iN	0.50	0.01	0.01			Product Granule 15ZS
07	02	iN	0.70	0.01	0.01			Product Oils 245/A
08	08					C01		Mixer Control Line
09	18						10s	Mixer ON timer
10	08					C02		Mixer Control Line
11	31					F03		Tare the Hopper
12	25					ADD25		Manual Additive #25
13	28					F09		Weight Additive #25
14	06					C01		Heater Control Line
15	30						15s	Heater ON time
16	06					C02		Heater Control Line
17	03	iN	0.70	0.01	0.01			Product Type 38/NY
18	04	iN	0.50	0.01	0.01			Product Granule 15ZS
19	32					F10		Switch to Gross
20	10					D04		Discharge Control Line
21	09					C51		Purge Pump Control
22	09					C23		Purge Pump Control
			===					
			2.90	Weigh hopper contents				
			===					

The GS2800 checks each Recipe as it is Printed to ensure that all the settings are correct. If the GS2800 finds any Steps in the Recipe which would cause a problem while batching, it prints an error code for that Step or for the Recipe as a whole. Automatic error checking includes verifying that the Control Codes are correct and that the Weigh Hopper will not overflow either as a result of one Step's Target Weight setting OR as a result of the Total Recipe weight to be batched. The GS2800 also checks the Recipe at the beginning of each batch to ensure that it is correct. As a safety measure, batching cannot commence if a Recipe contains errors.

**PRODUCTION REPORT -- RECIPE USAGE**

Date Last Cleared 10/09/1997 13:16:59

RECIPE	DESCRIPTION	BATCHES	WEIGHT
01	Formulation 25A/326M	000100	0000330.12kg
02	Mixture Type 15T	000000	0000000.00kg
03	Recipe 23AZX	000000	0000000.00kg
04	Unprogrammed Recipe	000000	0000000.00kg
04	Unprogrammed Recipe	000000	0000000.00kg
05	Unprogrammed Recipe	000000	0000000.00kg
06	Unprogrammed Recipe	000000	0000000.00kg
07	Unprogrammed Recipe	000000	0000000.00kg
08	Unprogrammed Recipe	000000	0000000.00kg
09	Unprogrammed Recipe	000000	0000000.00kg
10	Unprogrammed Recipe	000000	0000000.00kg
11	Unprogrammed Recipe	000000	0000000.00kg
12	Unprogrammed Recipe	000000	0000000.00kg
13	Unprogrammed Recipe	000000	0000000.00kg
14	Unprogrammed Recipe	000000	0000000.00kg
15	Unprogrammed Recipe	000000	0000000.00kg
16	Unprogrammed Recipe	000000	0000000.00kg
17	Unprogrammed Recipe	000000	0000000.00kg
18	Unprogrammed Recipe	000000	0000000.00kg
19	Unprogrammed Recipe	000000	0000000.00kg
20	Unprogrammed Recipe	000000	0000000.00kg

The GS2800's Usage Reports include the date and time the accumulated totals were last cleared. **NOTE YEAR 2000 date format.**

The GS2800 totalises Recipe Usage by Weight and Quantity. Weight is accumulated to 9 active digits, quantity to 6 digits. This allows the possibility of totalising nearly 1 million batches and 1 billion (t or lb or kg or any other units of weight) for each of the GS2800's 20 Recipes before having to clear the GS2800 memories.

**PRODUCTION REPORT -- MATERIAL LINE USAGE**

Date Last Cleared 10/09/1997 13:16:59

LINE	DESCRIPTION	WEIGHT
01	Product Type A#01Z	0000050.00kg
02	Product Oils 245/A	0000070.00kg
03	Product Type 38/NY	0000070.00kg
04	Product Granule 15ZS	0000100.00kg
05	Additive C2G, Volume	000015000c
06	Heater Control Line	0000000.00kg
07	Unused Line	0000000.00kg
08	Mixer Control Line	0000000.00kg
09	Purge Pump Control	0000000.00kg
10	Discharge Control Line	0000000.00kg
11	High Speed Feed Line	0000000.00kg
12	Alarm Output Line	0000000.00kg
13	Timer -- Discharge	0000000.00kg
14	Logic Pulse Counter	000000000c
15	Batch Log Control	0000000.00kg
16	Manual Additive	0000000.00kg
17	Weight of C2G	0001500.00kg
18	Mixer ON timer	0000000.00kg
19	Unused Line	0000000.00kg
20	Unused Line	0000000.00kg
21	Unused Line	0000000.00kg
22	Unused Line	0000000.00kg
23	Unused Line	0000000.00kg
24	Unused Line	0000000.00kg
25	Manual Additive #25	0000000.00kg
26	Unused Line	0000000.00kg
27	Unused Line	0000000.00kg
28	Weight Additive #25	0000025.00kg
29	Unused Line	0000000.00kg
30	Heater ON time	0000000.00kg
31	Tare the Hopper	0000000.00kg
32	Switch to Gross	0000000.00kg

Material Line usage is totalised for materials batched by Weight and materials batched by counts (Volume).

In addition, the GS2800 accumulates logic pulses for "dummy" counter lines.

The GS2800 can be programmed within a Recipe to accumulate the weight of materials which are batched by Volume, in addition to accumulating the volume of the material batched.

Recipe and Material Usage information can also be displayed by the GS2800. This Inventory Usage information is available to remote Computers communicating with the GS2800 via the Optional Serial I/O Card.

Printer Codes are entered into the GS2800's Recipes to instruct the GS2800 which type of Batch Log is to be printed via the standard Printer Output. The GS2800 can print "no log", an "exceptions only log" or a "full log" of every operation, exception and operator's response.

The Batch Log's heading includes details of the Recipe to be batched, the number of batches required and the proportion of the Recipe to be produced.

Each Recipe Step is fully recorded on the Batch Log while batching. The log includes the time that the Step was completed, the number and description of the Line "called up" for that Step, the Actual weight, volume, counts or time that was batched together with any variances. The accumulated total of the particular batch as well as the total of all the batches is included in the report.

The GS2800 checks and reports in excess of 100 potential error conditions while batching. The sample report includes one example -- a "Low Tolerance" error followed by a manual JOG operation. Prior to the "Lo Tol" error, the GS2800 had made the preset number of automatic JOG cycles without attaining the required weight. The number of automatic jog cycles is programmable from 0 to 99.

Gedge Systems -- Melbourne -- Australia

### *Batch Log*

High Speed Batch Controller

GS2800 S/No 34567 version 1:01 No 01 Capacity 30.00kg by 0.01kg

11/09/1997 16:42:25

Recipe N0 01 1 Batches at 100% of Material/counter Line Nos 1--9

Formulation 25A/326M

BATCH LOG		:	:	OPERATION			BATCHED
TIME	STEP/ACTION	:	LINE/DESCRIPTION	:	ACTUAL	VARIANT	TOTAL
-----							
16:42	START Rec 01	:	Formulation 25A/326M	:	Batch 00001of 00001at 100%		
16:42		:	Total at START	:			000000.00kg
16:42	01 Step Completed	:	15 Batch Log Control	:	P01		000000.00kg
16:42	02 Step Completed	:	01 Product Type A#01Z	:	N	0.49kg-- 0.01kg	000000.49kg
16:42	03 Step Completed	:	31 Tare the Hopper	:	N	0.00kg F03	000000.49kg
16:43	04 Step Completed	:	05 Additive C2G, Volume	:		00150c 00000c	000000.49kg
16:43	05 Step Completed	:	17 Weight of C2G	:		1.49kg F09	000001.98kg
16:44	06 UNDER LO TOL	:	04 Product Granule 15ZS	:	N	0.43kg-- 0.07kg	000001.98kg
16:44	JOG keyed	:		:			
16:44	06 UNDER LO TOL	:	04 Product Granule 15ZS	:	N	0.47kg-- 0.03kg	000001.98kg
16:44	JOG keyed	:		:			
16:44	06 Step Completed	:	04 Product Granule 15ZS	:	N	0.50kg-- 0.00kg	000002.48kg
16:44	07 Step Completed	:	02 Product Oils 245/A	:	N	0.70kg 0.00kg	000003.18kg
16:44	08 Step Completed	:	08 Mixer Control Line	:	C01	LINE ON	000003.18kg
16:44	09 Step Completed	:	18 Mixer ON timer	:		00010s 00000s	000003.18kg
16:44	10 Step Completed	:	08 Mixer Control Line	:	C02	LINE OFF	000003.18kg
16:44	11 Step Completed	:	31 Tare the Hopper	:	N	0.00kg F03	000003.18kg
16:44	12 Step Completed	:	25 Manual Additive #25	:		ADD25	000003.18kg
16:44	13 Step Completed	:	28 Weight Additive #25	:	N	0.08kg F09	000003.26kg
16:44	14 Step Completed	:	06 Heater Control Line	:	C01	LINE ON	000003.26kg
16:45	15 Step Completed	:	30 Heater ON time	:		00015s 00000s	000003.26kg
16:45	16 Step Completed	:	06 Heater Control Line	:	C02	LINE OFF	000003.26kg
16:45	17 Step Completed	:	03 Product Type 38/NY	:		0.71kg 0.01kg	000003.97kg
16:45	18 Step Completed	:	04 Product Granule 15ZS	:	N	0.51kg 0.01kg	000004.48kg
16:45	19 Step Completed	:	32 Switch to Gross	:	F10		000004.48kg
16:46	20 Step Completed	:	10 Discharge Control Line	:	D04	DISCH ON/OFF	000004.48kg
16:46	21 Step Completed	:	09 Purge Pump Control	:	C51	LINE ON	000004.48kg
16:46	22 Step Completed	:	09 Purge Pump Control	:	C23	LINE OFF	000004.48kg
16:46		:	BATCH Complete	:			000004.48kg
16:46		:	BATCHES Complete	:			000004.48kg

# Batching

The GS2800 processes a batch by sequentially following up to 32 instruction steps contained in one of the 20 Recipes stored in its memory. The Recipe, the proportion to batch and the number of batches is selected by the Operator using the GS2800's front panel keyboard. The GS2800 can batch a Recipe from 1% to 100% of the target settings and can produce up to 65,000 batches in one run.

Each Recipe Step can contain instructions to batch material by weight, to batch material by volume, to count events, to time out, to turn outputs ON or OFF conditionally or unconditionally and a host of other instructions that enable the GS2800 to control the entire batching process.

When the GS2800 commences a batch it starts at the Recipe's first step and processes each Step in turn until all the Recipe's Steps have been processed.

Because of the flexibility of the GS2800, with a huge variety of settings and instructions possible for each Recipe Step, there are literally thousands of different Batching Sequences that the GS2800 can perform. There are, however, a number of procedures carried out by the GS2800 regardless of the type of recipe being batched. These are detailed in the following.

The GS2800 is designed to be genuinely "user friendly" and "fail safe".

Every error includes an error message to alert the Operator. Every input required from the Operator by the GS2800 includes messages to alert the Operator if the wrong key is pressed and to advise which keys can be used and the range of values that may be entered.

The GS2800 assures the user of its accuracy, not only by extensive self checking when power is applied, but also by extensive self checking before and during batching. The self checks carried out when batching go much further than the already extensive procedures carried out by the GS2800 when power is first applied.

As an example of the GS2800's self checks:

The GS2800 can continue a batch from where it was stopped when the **STOP** key was pressed. Before continuing a batch, however, the GS2800 checks to ensure that the Recipe has not been changed AND that the gross weight in the hopper has not changed. These are two areas which, if ignored, could cause serious consequences for a batch of material. If they occur, the Operator is alerted to these conditions (and many more) by the GS2800. A choice can then be made to proceed with the Batch or to quit before any more material is processed.

As an additional example:

The GS2800 checks every Step of a Recipe BEFORE it actually starts a batch. In this way, the GS2800 ensures no batch is started unless all the settings are correct and will enable the batch to be completed. Some of the GS2800's checks include: will the weigh hopper overflow? is the control code recognised? is the next gross target weight greater than the previous target? are the Control Code numbers correct?

If any part of a Recipe is in error, the GS2800 immediately alerts the Operator with a description of the problem (including the Recipe Number, the Step number and a description of the Error). The problem must then be rectified before batching can commence.

Quality standards, as well as the need to maintain proper records in case of future conflict, dictate the need for an extensive log of operations while batching. The GS2800 satisfies this need by providing the user a very extensive batch log of every step in the batching process. The printed log includes the time at which each step was carried out. It also includes the target weight and actual weight as well as every error, every out of tolerance alarm, every operation and every Operator response to Batching messages and alarms.

The GS2800's batch log is a complete record of the batching process. It includes weight related Steps and "non weight" related functions that are carried out by the GS2800. These "non weight" functions may include the control of mixers and heaters and virtually any external switch controlled device.

The GS2800's front panel keyboard contains all the keys needed to control a batching process. The remote key inputs supplied as standard with the GS2800 are provided if remote batch control operation is required.

# Specifications

## Memory & Other Capacities.

**TIME & DATE:** Option BR2 supplied as standard for Time and Date on all reports and when totals are cleared.

**RECIPES:** 20 Recipes able to be selectively batched from 1% to 100% from 1 batch to 65,000 batches. Each Recipe comprising a 20 character alpha/numeric Description; a Recipe Number; and 32 Process Steps with each Step able to be programmed with: Target Weight, Count, Time, Logic Control Operation, Printer Control Operation, Message Display or Internal Function setting and High and Low Tolerance settings.

**LINES (Internal & Output):** 32 User definable Lines, 12 electrical control outputs and 20 internal logic functions. Each Line comprising: A 20 character alpha/numeric Description; Line Type settings for Materials, Counters, Timers, Controls, Printers, Functions and Messages; Batch In or Out by Net or Gross settings; In Flight Compensation, Automatic In Flight Compensation and High Speed Cutoff settings; a message for 'display while batching' setting; Time Out alarm setting and Auto/Manual Jog time setting.

**INPUT LINES:** 10 Input Lines comprising: 4 definable Logic Control and Pulse Counting Lines; 4 Batch control remote key Input Lines for STOP, START/CONTINUE, RESET and JOG; 1 Calibration/Setup Interlock Input (for remote key lock); 1 Discharge Door Interlock Alarm.

**ACCUMULATED TOTALS:** Memory for the Date and Time at which the Totals were last cleared; 6 digit quantity and 9 digit weight usage for each of the 20 Recipes; 9 digit weight usage for each of the 32 Lines.

## Enclosure & Environment.

**Display:** 13.8 mm high 12 character alpha/numeric 15 segment red led display. Display update rate 6 updates to 100 updates per second.

**Keyboard:** Sealed membrane keyboard with selectable audio feedback. 32 multi function keys with 73 Control, Numeric and Alpha selections.

**Physical:** All metal enamel finished desk mount enclosure. Panel mounting kit optional. (Option 04).

**Front:** 198mm wide x 96 mm high. **Body:** 184mm wide x 90mm high. Length overall 246mm. For panel mounting DIN standard cut out of 186mm wide x 92mm high. Rear projection 232mm.

**Weight:** 2.3kg. Shipping weight 3.5kg.

**Rear Panel:** Power cable appliance receptacle, fuse and fuse holder. Load cell, Logic Input/Output and Printer/Serial Input/Output connectors.

**Environment:** -- 10°C to + 40°C Operating. -- 15°C to + 70°C Storage. To 95%RH non condensing.

## Specification and Stability of the GS2800's Load Cell Input.

**A/D Rate:** 100 samples per second. The display update rate is user selectable from 100 updates per second to 6 updates per second.

**Sensitivity and Range:** Automatically adjustable from 0.66FVper display division to 112FVper display division. Maximum input signal is 45mV. The GS2800 will display from -- 4% to + 104% of the calibrated full scale electrical input. 16 bit internal resolution; From 400 to 8,000 display divisions.

**Linearity:** --/+ 0.01% of full scale.

**Stability, Span Stability:** --/+ 7.5ppm/°C

**Zero Stability:** For dead load offsets from 0mV to 15mV the greater of 0.2 display divisions/°C or 200nV/°C referred to input.

**Noise:** Maximum of 1FV peak to peak referred to input.

**Zero (Dead load) Adjustment Range:** -- 1mV to + 20mV.

**Load Cell Excitation:** 10VDC Indefinite Short Circuit Protected. The GS2800 will drive up to EIGHT 350 ohm load cells in parallel. Maximum excitation current is 230mA.

**Load Cell Excitation Sensing:** True differential remote sensing using a separate pair of wires to compensate for long load cell cables with no loss of sensitivity.

**Source and Input Impedance:** 2kOhm maximum source impedance. 10MOhm minimum input impedance.

**Analog Filter:** Active 20hz 2 pole low pass filter.

**Digital Filter:** Dual rate filter user settable via A/D averaging with auto--switching between rates. Settable range 100/second to 6/second.

## Standard Printer Output (Option 202).

**User Settings:** Transmission Rate only.

**Serial and Logic Signal Isolation:** All the GS2800's printer card logic inputs and serial outputs are optically isolated to 600 Volt maximum. (When LK1 is set for isolated operation.)

**Serial Type:** EIA RS--232C Serial data.

**Serial Stream Control:** No active handshake control. Printer must have a 4k minimum print buffer.

**Printer Status Alarm:** One "Printer Ready" input line to the GS2800. The line is generally connected to the printer's pin 4, RTS -- Request to Send line. The printer's RTS signal must assert the line pulling it up to a HIGH TTL level when ready and down to a LOW TTL level when not ready. If the printer is not ready, an alarm message is displayed when print is attempted, and the print attempt is aborted.

**Baud Rate:** Set via DIP switches on the printer board within the GS2800. Rate selectable from 600 to 9600 baud.

**Word size and Parity:** 10 bit data set per ASCII character comprising 1 start bit, 7 data bits (comprising an ASCII character), 1 even parity bit and 1 stop bit. Data is sent by the GS2800 in the order: **FIRST** start bit, b0 to b6 of the ASCII character, parity bit, **LAST** stop bit.

**OPTIONAL Serial I/O Card (Option 287)**

Printer Output specification identical to the standard Printer Output (Option 202).

**Serial I/O Secification:--**

**User Settings:** Transmission Rate only.

**Serial and Logic Signal Isolation:** All the GS2800's printer card logic inputs and serial outputs are optically isolated to 600 Volt maximum.

**Serial Type:** Selectable EIA RS--232C, EIA RS--422A or EIA RS--485 Multipoint Serial data.

**Serial Stream Control:** No active handshake control.

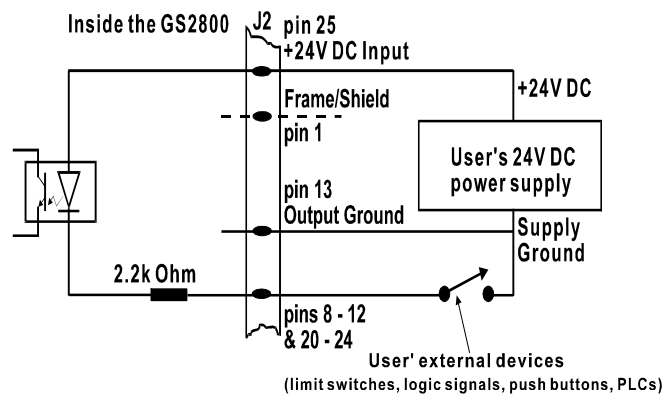
**Baud Rate:** Set via DIP switches on the Serial I/O & Printer card within the GS2800. Rate selectable from 600 to 9600 baud, 2400 recommended for serial I/O.

**Word size and Parity:** 10 bit data set per ASCII character comprising 1 start bit, 7 data bits (comprising the ASCII character), 1 even parity bit and 1 stop bit. Data is sent by the GS2800 in the order: **FIRST** start bit, b0 to b6 of the ASCII character, parity bit, **LAST** stop bit. Data should be sent to the GS2800 in the order: **FIRST** start bit, b0 to b6 of the ASCII character, parity bit, **LAST** stop bit.

**Electrical Specification, GS2800's Inputs.**

The GS2800 has ten (10) optically isolated inputs, each having an internal current limiting 2.2k Ohm resistor. The inputs are suitable for connection to switches, relay contacts, Opto coupler outputs, PLCs and other logic devices.

**GS2800's Control Connector - Inputs.**



Inputs are **ON** when shorted to the external power supply low through the user's device. Inputs are **OFF** when the user's device is open circuit.

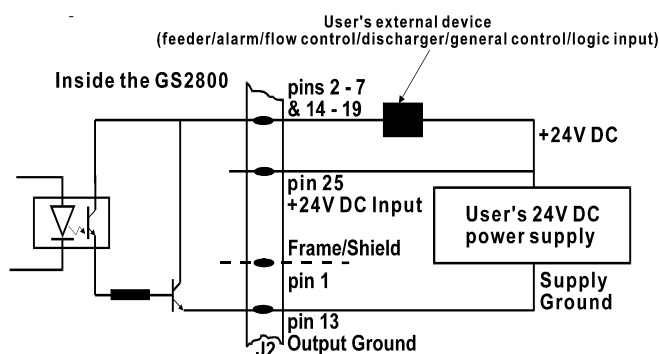
The user's external 24V DC power supply HIGH is to be connected to the + 24V IN pin of the GS2800's Input Connector, and the LOW to each of the GS2800's inputs through the user's device.

**Electrical Specification, GS2800's Outputs.**

Twelve (12) optically isolated outputs. Each output is an optically isolated open collector solid state switch capable of sinking a maximum of 100mA at a maximum of 45V DC.

The outputs are suitable for connection to the user's logic supply for TTL/CMOS devices such as Opto--22 relays, Opto couplers or small PCB mounted relays drawing less than 100mA coil current with reverse bias diode protection across the coil.

The outputs are ON when sinking current to output ground through the user's device and are OFF when open circuit.



**GS2800's Control Connector - Outputs.**

The user's external power supply Low (Control Ground) is to be connected to the common output ground of the GS2800 (pin 13) and the high to each output through the user's device.



**WEIGHT INDICATING, CONTROLLING & PRINTING PRODUCTS  
AUSTRALIAN DESIGNED AND MANUFACTURED**

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