

**5000
DIGITAL
INDICATOR**

**Communications
Manual**

**For use with Software
Versions 4.xx**

1. INTRODUCTION	2
2. CONNECTION OF THE 5000 NETWORK.....	3
2.1 RS232 CONNECTION.....	3
2.2 RS485/RS422 CONNECTION.....	3
3. COMMAND OVERVIEW.....	4
3.1 COMMANDS AND QUERIES	4
3.2 RESPONSES	4
3.3 PARAMETERS	4
3.4 TERMINATION	4
3.5 TRADE COUNTER:	4
4. COMMAND DETAILS.....	5
4.1 ADR SET ADDRESS	5
4.2 ASF SET FILTERING.....	6
4.3 BDR SET BAUD RATE.....	6
4.4 CDL SET ZERO.....	8
4.5 CLK SET CLOCK.....	8
4.6 COF SET OUTPUT FORMAT.....	8
4.7 CWT SET CALIBRATION WEIGHT.....	10
4.8 ENU SET UNITS.....	11
4.9 ESR? QUERY STATUS.....	12
4.10 IAD SET SCALE BUILD	13
4.11 ICR SET MEASUREMENT RATE	13
4.12 LBT BUTTON LOCK SETTINGS	14
4.13 IDN SET IDENTIFICATION.....	15
4.14 LDW CALIBRATE ZERO DEAD WEIGHT.....	16
4.15 LIC LINEARISATION.....	17
4.16 LIL LIMIT VALUE LABELS	17
4.17 LIS LIMIT VALUE SETTINGS.....	18
4.18 LIV SET LIMIT VALUE.....	19
4.19 LWT CALIBRATE SPAN.....	20
4.20 MSV? QUERY MEASURED WEIGHT VALUE.....	20
4.21 MTD MOTION SETTINGS	22
4.22 PFT PRINTED TICKET OUTPUT FORMAT	22
4.23 PRS PRINTER/SERIAL 2 SETTINGS	23
4.24 PRT PRINT.....	23
4.25 PST SET PRINTER HEADERS.....	24
4.26 RBT REMOTE BUTTON SETTINGS	25
4.27 RES RESET	26
4.28 STP STOP CONTINUOUS TRANSFER.....	26
4.29 Sxx SELECT UNIT	27
4.30 TAR TARE	27
4.31 TAS GROSS / NET.....	28
4.32 TAV SET TARE VALUE.....	28
4.33 TDD LOAD/SAVE SETUP.....	29
4.34 VAL? MV/V VALUE QUERY.....	29
4.35 WMD SET WEIGHING MODE	29
4.36 ZST ZERO SETTINGS	30
5. COMMAND SUMMARY	31
5.1 SET SCALE BUILD.....	31
5.2 CALIBRATION	31
5.3 SET OPERATING PARAMETERS	31
5.4 SET COMMUNICATION PARAMETERS.....	31
5.5 GENERAL COMMANDS	32
5.6 QUERIES.....	32

1. Introduction

This manual details the extended communications protocol of the 5000. A simple direct protocol that mimics the pressing of the front panel keys is described in the reference manual.

The extended protocol allows for complete calibration and control of a multi-drop network of up to thirty-two 5000 units.

2. Connection of the 5000 Network

2.1 RS232 Connection

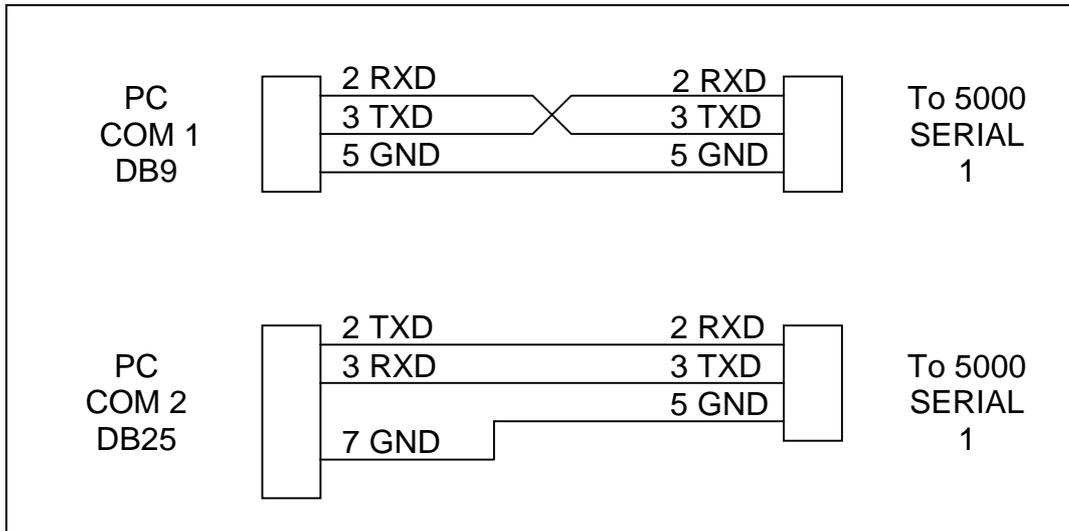


Figure 1: Connection of a single 5000 unit to an IBM PC either using COM1 or COM2 on the PC.

2.2 RS485/RS422 Connection

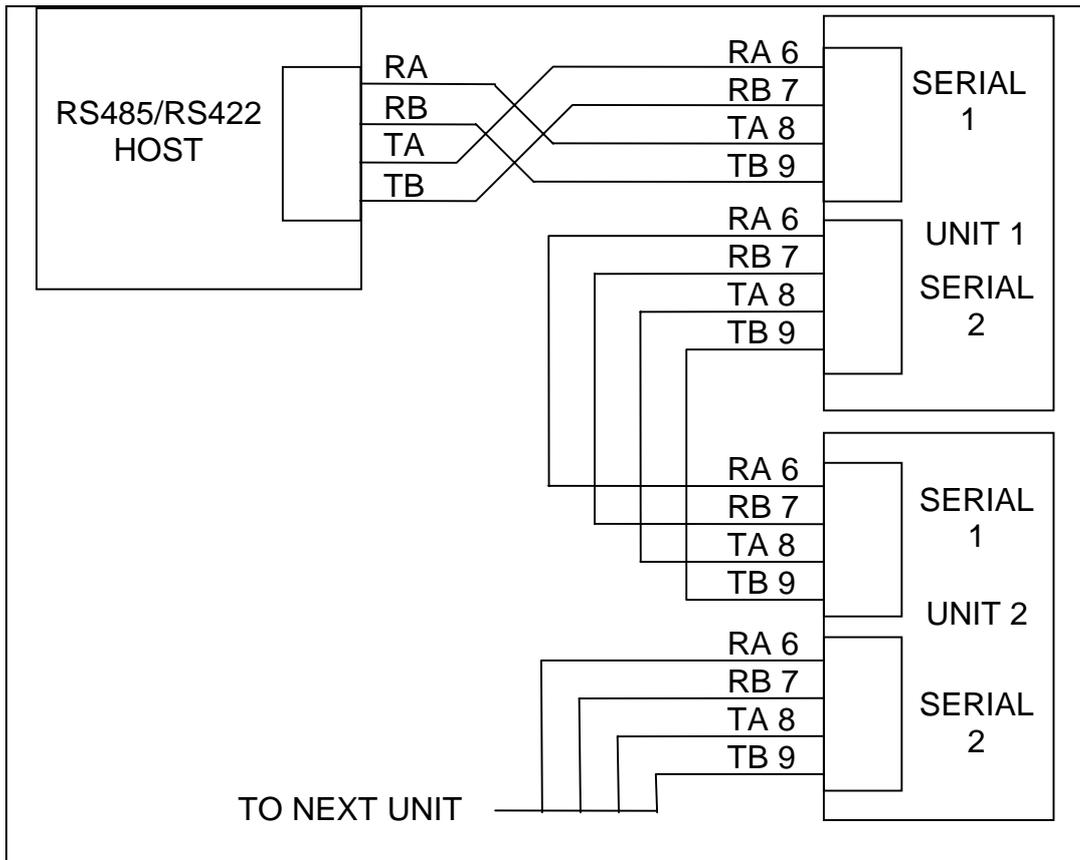


Figure 2: Connection of a RS485/RS422 network.

3. Command Overview

3.1 Commands and Queries

A command consists of three ASCII-characters (eg IDN).

A query consists of four ASCII characters and ends with a question mark (eg. IDN?).

3.2 Responses

The 5000 responds with *0CRLF* to indicate that a command has been accepted or *?CRLF* to indicate that the command was either not understood or could not be performed.

Specific queries cause the 5000 to respond with the data requested by the query. (e.g. The 5000 would respond with 4 to a ADR? Query if it was setup with address 4)

3.3 Parameters

A command or query can be followed by one or more parameters.

Parameters are either numeric (e.g. 3000) or strings (e.g. "Fred").

String parameters are delimited by quote characters ("" ASCII 34). They are taken literally so that "AbC d" is not the same as "abcd".

Numeric parameters are variable and leading and trailing spaces are ignored. As a result 003 03 and 3 are identical.

Parameters are separated by the comma sign (',' ASCII 44).

Parameters may be left out completely so that it is possible to change one parameter without altering the others. For example IAD1,,2; will change the position of the decimal point only.

3.4 Termination

Termination characters are sent to define the end of a command, query or response.

Permissible termination characters are ';' (ASCII 59), *LF* (ASCII 10), *CRLF* (ASCII 13 10), *LFCR* (ASCII 10 13). E.g. ADR?; is the same as ADR? *CRLF*

The 5000 always uses *CRLF* as the termination of its responses.

3.5 Trade Counter:

All trade relevant functions are guarded by the trade counter. There is no difference in changing settings via the communications interface or via the front panel. If the counter reaches 60000 the 5000 operation is blocked and it must be returned to the factory.

Note that the 5000 does not check to see if new data is different from the old data before incrementing the Trade Counter, so sending IAD1,6000 will increment the counter even if the 5000 is setup with a fullscale of 6000 kg already.

4. Command Details

4.1 ADR SET ADDRESS

Set the address of a unit.

General

No. of parameters	2
Save changes.	with TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Address	0 .. 31	31
2	Serial Number	“0000001” .. “9999999”	“xxxxxxx” factory set

Each 5000 must be assigned a unique address to enable the implementation of a multi-drop network. This address can be set using the digital setup menus as described in the reference manual. It is also possible to use the network itself to set the unit addresses. The ADDRESS COMMAND is used to assign the unit address via the communications network,

Before the address of a unit can be changed the unit must be selected to respond to commands. The SELECT COMMAND (see Sect 4.29 pg 27) is used to select a unit. If the current address of the unit is known use this to select the unit, if not issue the S99; command to select all units. To distinguish between units of the same address use the serial number parameter of the ADDRESS COMMAND. The serial number is unique to each units and only the unit with the matching serial number will respond to the ADDRESS COMMAND. If neither the current address nor serial number of the units is known, turn off all the units in the network and then turn on one unit at a time. The combination of S99; and ADR commands will then allow each unit to be configured.

Example 1:

Change address of unit from 1 to 2

S01;		Select unit 1
ADDR2;	0 CRLF	Set address to 2
TDD1;	0 CRLF	Save change
S02;		Select new unit 2
IDN?;	WE,"WE2110",,"123456",P50 CRLF	ask for ID

Example 2:

Two units with unknown addresses are configured using their serial numbers.

S99;			
ADR01,"123456";	0	CRLF	unit with serial no. "123456" gets address 01
ADR02,"123457";	0	CRLF	unit with serial no. "123457" gets address 02
TDD1;	0	CRLF	save address against power loss
S01;			select the new unit 1
IDN?;	WE"WE2110",	"123456",P50	CRLF ask for ID

4.2 ASF SET FILTERING

Set the filtering characteristics of a unit.

General

No. of parameters	2
Save changes.	with TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range		Default
1	Number of consecutive readings to average	0	1	9
		1	2	
		2	3	
		3	4	
		4	5	
		5	6	
		6	7	
		7	8	
		8	9	
		9	10	
		10	25	
		11	50	
		12	75	
		13	100	
2	Anti-Jitter Setting	0	off	0
		1	fine	
		2	coarse	

Example:

S01;		Select unit 1
ASF?;	9,0	CRLF Query filtering setting
ASF4,1;	0	CRLF Changed to a 5 reading average with fine anti-jitter setting.
TDD1;	0	CRLF Save new settings.

4.3 BDR SET BAUD RATE.

Set the communication parameters, baud rate, parity etc.

General

No. of parameters 4
 Save changes. with TDD1
 Increment Trade Counter no

Parameter Details

Parameter	Description	Range	Default
1	Baud Rate	1 300	6
		2 600	
		3 1200	
		4 2400	
		5 4800	
		6 9600	
		7 19200	
2	Parity	0 none	0
		1 odd	
		2 even	
3	Data Bits	7,8	8
4	Stop Bits	1,2	1
5	Termination Resistors	0 OFF	0
		1 ON	

Example:

Change baud rate settings of unit 1.

S01;		Select unit 1
BDR?;	6,0,8,1,0 CRLF	Query baud rate setting
BDR4,1,7,1,1;	0 CRLF (Note that the reply is sent using the new settings)	Settings changed to 2400 baud, odd parity, 7 data bits, 1 stop bit, termination on.
TDD1;	0 CRLF	Save new settings.

4.4 CDL SET ZERO.

Set the zero dead load cancellation. This is analogous with pressing the ZERO key on the front of the instrument.

General

No. of parameters	0
Save changes.	At input
Increment Trade Counter	no

If the Setzero operation is not possible due to the value of the current weight reading or due to instability the 5000 will return '?'.
Example:

Set zero dead load of unit 1.

S01;		Select unit 1
CDL;	0 <i>CRLF</i>	Zero dead load set successfully.
	< load disturbed>	
CDL;	? <i>CRLF</i>	Setting of zero dead load not possible due to motion, error or dead load range.

4.5 CLK SET CLOCK

Set the time and date.

General

No. of parameters	6
Save changes.	At input
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Hour	0..23	-
2	Minute	0..59	-
3	Second	0..59	-
4	Date	1..31	-
5	Month	1..12	-
6	Year*	1998..2098	-

Example:

S01;		Select unit 1
CLK?;	9,20,10,16,2,1999	Query current time & date
	<i>CRLF</i>	
CLK10,0,0,17,2,2001;	0 <i>CRLF</i>	Change to 10 am 23/6/2001
CLK10,0,0,17,2,01;	0 <i>CRLF</i>	Same as above

* The Year may be set either in 2 digit or 4 digit format. The instrument will convert this to a 4 digit year automatically. E.g. 2/2/1 is converted to 2/2/2001.

4.6 COF SET OUTPUT FORMAT.

Set the output format of the MSV? Query.

General

No. of parameters 1
 Save changes. with TDD1
 Increment Trade Counter no

Parameter Details

Parameter	Description	Range	Default
1	Format setting	0..11	6

Binary Formats

Format	Data	Order
0	4 Byte (binary) CRLF	MSB before LSB(=00h)
2	2 Byte (binary) CRLF	MSB, LSB
4	4 Byte (binary) CRLF	LSB(=00h) before MSB
6	2 Byte (binary) CRLF	LSB, MSB
8	4 Byte (binary) CRLF	MSB before LSB (=Status)

ASCII Formats

Format	Parameter 1	Parameter 2	Parameter 3
1 & 3	Weight (8)		CRLF
5 & 7	Weight (8)	, Address (2)	CRLF
9 & 10	Weight (8)	, Address (2)	, Status (3) CRLF
11	Weight (8)	, Address (2)	, Extended Status (3) CRLF

Values in brackets signify the number of characters in the fixed length response.

The weight format is the sign (space or minus), followed by 7 digits 0..9 including the decimal point if used.

The binary formats are useful for PLC communications in applications where conversion of the ASCII weight string is not possible. The binary outputs can generally be used directly by the PLC.

STATUS Details

Status	Description	Bit	Comment
001	Overload	0	Weight reading out of range overload or underload
002	Standstill	1	
004	Gross	2	
008	Range 2 active	3	Only with multi-range or multi-interval
016	Limit Value 1 active	4	
032	Limit Value 2 active	5	
064	Limit Value 3 active	6	
128	Limit Value 4 active	7	
256	Centre of Zero	8	This status bit is only available in the extended status - Format 11 only.

Note that the status bits are added together, for example a status of 6 (4+2) means the weight reading is a Gross value with no motion, range 1, and all limit values are inactive.

Example 1:

S01;		Select unit 1
COF?;	3 <i>CRLF</i>	Query format
MSV?;	-00001.0 <i>CRLF</i>	Query weight reading.
COF9;	0 <i>CRLF</i>	Change to format 9
TDD1;	0 <i>CRLF</i>	save new setting
MSV?;	-00001.0,01,006 <i>CRLF</i>	Query weight reading using the new format.

Example 2: Use of Binary format for PLC use

Initialisation

S01;		Select unit 1
COF8;	0 <i>CRLF</i>	Set format 8
TDD1;	0 <i>CRLF</i>	Save format setting

PLC Operation

MSV?;	<i>CRLF</i>	Query weight reading using the new format. In this example the weight is a stable gross reading of 1000 kg. COF 8 replies with < 24 bits of weight><8 bit status><CRLF> the hexadecimal values of the returned data are <00><01><E8><06><0C><0A> but this data is not printable directly.
-------	-------------	---

4.7 CWT SET CALIBRATION WEIGHT.

Set the calibration weight to be used for span calibration. This must be set before using the LWT; span calibration command.

General

No. of parameters	1
Save changes.	with TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Calibration Weight	2% - 100% of full scale weight. (Send IAD? to read full scale setting)	3000

Example:

S01;		Select unit 1
CWT?;	3000 CRLF	Query calibration weight setting
CWT4000;	0 CRLF	Change calibration weight to 4000.
	(Note that weight is sent without any decimal point. So 400.0 kg is send as 4000 not 400.0)	
TDD1;	0 CRLF	Save new setting.

4.8 ENU SET UNITS

Set the units of weight to be displayed and printed.

General

No. of parameters	1
Save changes.	with TDD1
Increment Trade Counter	yes

Parameter Details

Parameter	Description	Range	Default
1	Weight units	0 none 1 g 2 kg 3 lb 4 t	2

Example:

S01;		Select unit 1
ENU?;	2 CRLF	Query units setting.
ENU1;	0 CRLF	Change units to grams
TDD1;	0 CRLF	Save new setting.

Parameter Details

Parameter	Description	Range	Default
1	Measurement Rate in Hz.	15-60	50

Example:

```

S01;                               Select unit 1
ICR?;                               50 CRLF      Query current measurement
                                       rate
ICR60;                             0 CRLF      Change to 60 Hz
TDD1;                               0 CRLF      save setting.
    
```

4.12 LBT BUTTON LOCK SETTINGS

Set the operation status of each of the 4 front panel buttons.

General

```

No. of parameters                2
Save changes.                    With TDD1
Increment Trade Counter          no
    
```

Parameter Details

Parameter	Description		Range	Default
1	Button	0	ZERO	0
		1	TARE	
		2	GROSS/NET	
		3	PRINT	
2	Operation	0	LOCK	1
		1	NORMAL	
		2	IMMEDIATE	

Operation of each of the 4 front panel buttons may be set independently. NORMAL is obviously the normal function of the button. LOCK means that the button is locked and its' normal operation is blocked. IMMEDIATE allows for the button function to operate without waiting for stable readings.

Example:

```

S01;                               Select unit 1
LBT0?;   1 CRLF                    ZERO is currently set to NORMAL Operation
LBT0,0;  0 CRLF                    Block operation of the ZERO button
TDD1;    0 CRLF                    save setting.
    
```

4.13 IDN SET IDENTIFICATION

Set the unit identification string.

General

No. of parameters	1
Save changes.	With TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Identification string. (15 bytes max).	" string "	"WE2110"
2	Serial Number string	"000000" .. "999999"	factory set, unique to each unit
3	Version string	P50 - P59	

Note that only the identification string may be changed. The serial number and version are fixed at the factory and are available for information only by using the IDN? Query.

Example:

S01;		Select unit 1
IDN?;	WE"WE2110","123456",P52HCRLF	Query current identification.
IDN"Site A";	0 CRLF	Change identification string to "Site A"
TDD1;	0 CRLF	save setting.

4.14 LDW CALIBRATE ZERO DEAD WEIGHT

It is possible to calibrate the zero dead weight either with no load on the scale base or the calculated mV/V signal may be entered directly.

General

No. of parameters	0 (1 if using direct mV/V cal)
Save changes.	With TDD1
Increment Trade Counter	yes

a) Calibration with Weight

This type of calibration is used with Weighing Modes 1,2&3 (See WMD command).

The calibration process takes some time to complete. As a result it is necessary to monitor the calibration process to determine when it is finished. To do this issue a LDW? Query. Following is a list of the possible calibration status responses.

Calibration Status

Status Value	Description
0	Calibration finished successfully
1	Calibration in process (Busy)
101	Error Zero too high (> 2 mV/V), Calibration aborted.
102	Error Zero too low (<-2 mV/V), Calibration aborted.

Example:

S01;		Select unit 1
LDW;	0 CRLF	Start zero calibration.
LDW?;	1 CRLF	Query status of the zero calibration process
LDW?;	1 CRLF	still busy
LDW?;	0 CRLF	zero calibration finished
TDD1;	0 CRLF	save setting.

b) Direct mV/V calibration

When using direct mV/V calibration (weighing mode 4) the mV/V signal level is entered directly.

Parameter Details

Parameter	Description	Range	Default
1	Dead load signal in mV/V. 20000 = 2.0 mV/V	-20000..20000	0

Example:

S01;		Select unit 1
VAL?;	5076CRLF	Current reading is 0.5076 mV/V
LDW5076;	0 CRLF	Set zero dead load to 0.5076mV/V.
LDW?;	5076CRLF	Zero dead load is 0.5076mV/V
TDD1;	0 CRLF	save setting.

4.15 LIC LINEARISATION

This command gives access to the multi-point linearisation functions of the 5000. A special query LIC? is available to verify the linearisation correction.

General

No. of parameters	2
Save changes.	With TDD1
Increment Trade Counter	yes

Parameter Details

Parameter	Description	Range	Default
1	Linearisation Point	1..5	1
2	Test Weight Value	0..999999	-

Query Details

Parameter	Description	Range
1	Percentage of Full Scale reading	-100..100
2	Correction (in weight units x10)	-100000 .. 100000

To clear one of the Linearisation points leave the test weight value off.

Example: Scale Build is max1 = 500.0 kg, e1 = 0.1 kg

```

S01;                               Select unit 1
LIC1;    0 CRLF                     Clear Linearisation Point 1.
LIC?1;   0,0 CRLF                    No correction for point 1
MSV?;    120.5 CRLF
LIC1,1200; 0 CRLF                    Set Linearisation Point 1 to correct for the
                                        current test weight of 1200 kg.
                                        (Note that weight is sent without any decimal
                                        point. So 400.0 kg is send as 4000 not 400.0)
LIC?1;    24,-50 CRLF                Current linearisation is approx. -5.0 kg at 24%
                                        of fullscale reading.
TDD1;    0 CRLF                       save setting.

```

4.16 LIL LIMIT VALUE LABELS

This command allows the two setpoint materials to be given labels.

General

No. of parameters	2
Save changes.	With TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Material	1..2	1
2	Label (10 chars max)	"string"	-

Example:

```

S01;                               Select unit 1
LIL?1;    "Mat.1" CRLF              Current Material 1 label.
LIL1,"Cement"; 0 CRLF               Material 1 label changed to "Cement"
TDD1;    0 CRLF                       save setting.

```

4.17 LIS LIMIT VALUE SETTINGS

Set the general operation parameters for batching operation of the setpoints.

General

No. of parameters	9
Save changes.	With TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Automatic Inflight Adjustment	0 .. 100%	0
2	Finish Delay	1..200	20
3	Material 1 Delay	0..200	20
4	Material 2 Delay	0..200	20
5	Single Feeder active only	0..1	0
6	Show Batch Number at start	0..1	1
7	Delay at start of fill	0..1	1
8	Pause on Error	0..1	1
9	Auto Start	0..1	0

Example:

S01;		Select unit 1
LIS?;	0,20,20,20,0,1,1,1,0	Get Current Settings.
	<i>CRLF</i>	
LIS50,5,1,1,0,0,0,0,1;	<i>0CRLF</i>	Change settings to: 50% inflight adjustment 0.5 seconds of finish time 0.6 seconds of delay for material 1 and 2 Multiple feeders active, Don't show batch number No fill start delays, No Error checking, Automatic restart.
TDD1;	<i>0 CRLF</i>	save setting.

4.18 LIV SET LIMIT VALUE

Set the parameters for the four setpoints.

General

No. of parameters	10
Save changes.	With TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default	
1	setpoint number	1..4	-	
2	Active	0	off	0
		1	on	
		2	Material 1	
		3	Material 2	
		4	Dump	
		5	Finish	
		6	Motion	
		7	Zero	
3	Data source	1	gross	1
		2	net	
4	Switching direction	1	over	1
		2	under	
5	Target Weight	-999999 .. 999999	0	
6	Pre-flight Weight	0 .. 999999	0	
7	Hysteresis Weight	0 .. 999999	0	
8	Logic	1	Active High	1
		2	Active Low	
9	Lock	0	off	0
		1	on	
10	Alarm	0	off	0
		1	single	
		2	dual	
		3	continuous	

Example:

S01;		Select unit 1
LIV?1;	1,0,1,1,0,0,0,1,0,0 <i>CRLF</i>	Query setpoint 1 parameters
LIV1,1,1,1,1000,100,10,1,0,0; 0 <i>CRLF</i>		Change to: active,gross, over switching, target = 1000 preflight = 100 hysteresis = 10 active high logic, no lock, alarm off, save setting.
TDD1;	0 <i>CRLF</i>	

4.19 LWT CALIBRATE SPAN

It is possible to calibrate the span either with test weights on the scale base or the calculated mV/V span signal may be entered directly.

General

No. of parameters	0 (1 if using direct mV/V calibration)
Save changes.	With TDD1
Increment Trade Counter	yes

a) Calibration with Weight

The calibration process takes some time to complete. As a result it is necessary to monitor the calibration process to determine when it is finished. To do this issue a LWT? Query. Following is a list of the possible calibration status responses.

Calibration Status

Status Value	Description
0	Calibration finished successfully
1	Calibration in process (Busy)
103	Error Span too Low (< 0.1mV/V), Calibration aborted.
104	Error Span too high (> 3.0 mV/V), Calibration aborted.
105	No Zero calibration

Example:

S01;		Select unit 1
LWT;	0 CRLF	Start span calibration.
LWT?;	1 CRLF	Query status of the span calibration process
LWT?;	1 CRLF	still busy
LWT?;	0 CRLF	span calibration finished
TDD1;	0 CRLF	save setting.

b) Direct mV/V calibration

When using direct mV/V calibration (weighing mode 4) the mV/V span signal level is entered directly.

Parameter Details

Parameter	Description	Range	Default
1	Span signal in mV/V. 20000 = 2.0 mV/V	0..30000	20000

Example:

S01;		Select unit 1
LWT15000;	0 CRLF	Set span to 1.5 mV/V.
LWT?;	15000CRLF	Span is 1.5000 mV/V
TDD1;	0 CRLF	save setting.

4.20 MSV? QUERY MEASURED WEIGHT VALUE

Query weight readings.

General

No. of parameters	2
Save changes.	-
Increment Trade Counter	-

Parameter Details

Parameter	Description	Range	Default
1	Type of reading	1 displayed weight	1
		2 gross weight	
		3 net weight	
		4 No. of batches	
		5 Total 1	
		6 Total 2	
		7 Peak weight	
2	Number of consecutive readings (0 means continuous output)	0..60000	1

Example:

```

S01;                               Select unit 1
COF3;                               set output format 3
MSV?;                               query displayed weight
MSV?2;                              query gross weight
MSV?2,5;                             query the next 5
                                     consecutive gross weight
                                     readings.

MSV?,0                               Enable continuous output
00400.0 CRLF
00400.1 CRLF
00400.2 CRLF
00400.3 CRLF
00400.4 CRLF
CRLF

STP;                               Stop continuous output
    
```

Note that the *CRLF* is sent after each reading for the ASCII formats but not for the binary formats. With the binary formats a single *CRLF* is sent at the end of the response regardless of the number of readings requested. To stop continuous output send a STP; command. During continuous output the 5000 will not respond to other commands. The format of data returned from the MSV? command is controlled by the COF setting. See the COF command for details on the available formats.

4.21 MTD MOTION SETTINGS

Alter the Motion Option settings.

General

No. of parameters	1
Save changes.	With TDD1
Increment Trade Counter	yes

Parameter Details

Parameter	Description	Range	Default
1	Motion Setting	0 OFF	1
		1 0.5d in 1 sec	
		2 1.0d in 1 sec	
		3 2.0d in 1 sec	
		4 5.0d in 1 sec	
		5 0.5d in 0.5 sec	
		6 1.0d in 0.5 sec	
		7 2.0d in 0.5 sec	
		8 5.0d in 0.5 sec	
		9 0.5d in 0.2 sec	
		10 1.0d in 0.2 sec	
		11 2.0d in 0.2 sec	
		12 5.0d in 0.2 sec	

Example:

```
S01;          Select unit 1
MTD?;    1 CRLF  Current Motion detection is 0.5 divisions in 1 second.
MTD2;    0 CRLF  Set Motion detection to 1.0 divisions in 1 second.
TDD1;    0 CRLF  save setting.
```

4.22 PFT Printed Ticket Output Format

Alter the format string for the printed ticket output. This is the output format used when ticket printing is selected via the PRS command.

General

No. of parameters	1
Save changes.	With TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Format String (up to 50 chars)	"String"	""

A format string of "" forces the use a the default ticket format as described in the Reference Manual.

Example:

```
S01;          Select unit 1
PFT?;    ""CRLF  Default format active.
```


Increment Trade Counter -

Parameter Details

Parameter	Description	Range	Default
1	Reply type	0 Normal reply 1 Reply with details of printout	0
2	Format String (up to 250 chars)	"String"	-

Query Details

Parameter	Description	Range
1	Last Printed ID number	0..999999

Example:

Command	Reply	Serial 2 Output	
S01;			Select unit 1
PRS2,1,,0,0;	0 CRLF		Select Single Line printout with no space
PRT;	0 CRLF	000127 10/02/1999 10:30:05 124.6 kg G	Force unit to print using the printer port exactly the same as pressing the print key.
PRT?;	127 CRLF		Return Print ID number = 127
PRT1;	128,10,31,15, 10,02,1999,1 50.7 CRLF	000128 10/02/1999 10:31:15 150.7 kg G	Same as PRT; but the ID, date, time and weight are returned as part of the reply.
PRT,"Weight is \G\E";	0 CRLF	Weight is 175.7 kg G	Formatted weight printout defined by the format string.

4.25 PST SET PRINTER HEADERS

Set the 2 line header for printed tickets.

General

No. of parameters	2
Save changes.	With TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Line number	1..2	1
2	Line contents	" string up to 20 chars "	" "

PST Example:

S01;			Select unit 1
PST?1;	" Weight	" CRLF	Query line 1 data
PST?2;	" Ticket	" CRLF	Query line 2 data
PST1,"Joe Bloggs Pty Ltd";	0 CRLF		Change line 1
PST2,"ph 3312 1234";	0 CRLF		Change line 2
TDD1;	0 CRLF		save setting.

4.26 RBT Remote Button Settings

Setup the function of each of the 4 remote inputs or artificially force the execution of the function.

General

No. of parameters	3
Save changes.	With TDD1
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Input number	1..4	1
2	Operation*	0 None 1 Zero 2 Tare 3 Gross/Net 4 Print 5 Blank 6 Lock 7 Show Total 8 Clear Total 9 Undo M+ 10 Batch Start 11 Batch Pause/Abort 12 Interlock 13 Dump Enable 14 Single Tx Serial 1 15 Single Tx Serial 2 16 Manual Hold 17 Peak Hold	0
3	Duration of key press	0 Short Press 1 Long Press	0

* if parameter 2 is omitted the function of the remote button is executed as if the remote input itself was exercised. This may be used to implement the extended features available with external keys without the need to actually install the accessory card and physical buttons. Parameter 3 allows both long and short key presses to be simulated.

RBT Example:

S01;		Select unit 1
RBT?1;	0CRLF	Get current operation of input 1
RBT1,10;	0CRLF	Change input 1 to "Batch Start" function
TDD1;	0 CRLF	save setting.
RBT1;	0 CRLF	Simulate "Batch Start" key press
RBT1,1;	0 CRLF	Simulate long press of "Batch Start" key which forces material totals to be printed and cleared.

4.27 RES RESET

Use this command to simulate a power-on reset.

General

No. of parameters	0
Save changes.	-
Increment Trade Counter	-

Example:

S01;	Select unit 1
RES	Reset unit.

4.28 STP STOP CONTINUOUS TRANSFER

Stop continuous weight transmission started by MSV?,0; command.

General

No. of parameters	0
Save changes.	-
Increment Trade Counter	-

Example:

S01;		Select unit 1	
MSV?,0;	00400.0 CRLF	Start	continuous data
	00400.1 CRLF	transmission.	
	00400.2 CRLF		
	...		
STP		Stop	continuous data
		transmission.	

4.29 Sxx SELECT UNIT

The Sxx command is used to select one or more units with which to communicate.

S00 to S31 selects a single unit with the matching address 00 to 31.

S96 to S99 have special functions:

S96: de-select all units.

S97 & S98: All units are selected but none reply to commands. This mode is very useful for blanket commands for an entire network of units.

S99 selects all units and all respond. S99 is useful when a single unit is connected to the network as it is possible to select this unit regardless of its address setting.

Example:

S01;		Select unit 1
MSV?;	00400.0 <i>CRLF</i>	Query current weight
S02;		Select unit 2
MSV?;	00623.5 <i>CRLF</i>	Query current weight.
S96;		De-select all units

4.30 TAR TARE

Force a TARE operation.

General

No. of parameters	0
Save changes.	At input
Increment Trade Counter	no

This command is exactly the same as pressing the TARE key on the front of the instrument except that the 5000 does not wait for no motion. If the current weight reading is not stable the 5000 will return '?' and ignore the TAR command.

Example:

S01;		Select unit 1
MSV?;	00400.0 <i>CRLF</i>	Query current weight
TAR;	0 <i>CRLF</i>	TARE
MSV?;	00000.0 <i>CRLF</i>	Query current weight reading.
MSV?1	00400.0 <i>CRLF</i>	Query gross weight

4.31 TAS GROSS / NET

Select Gross or Net weight display.

General

No. of parameters	1
Save changes.	At input
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	Gross or Net	0 net 1 gross	-

Example:

S01;		Select unit 1
MSV?;	00200.0 CRLF	Query current weight
TAS?;	0 CRLF	unit is in net mode
TAS1;	0 CRLF	Switch to Gross weight
MSV?;	00400.0 CRLF	Query current weight
TAS?;	1 CRLF	unit is in gross mode

4.32 TAV SET TARE VALUE

Set a numeric tare value directly.

General

No. of parameters	1
Save changes.	At input
Increment Trade Counter	no

Parameter Details

Parameter	Description	Range	Default
1	TARE value	0 .. full scale	-

Example:

S01;		Select unit 1
MSV?2;	00300.0 CRLF	Query net weight
TAV?;	1000 CRLF	Tare value is 100.0
TAV2000;	0 CRLF	Set Tare value to 200.0
MSV?2;	00200.0 CRLF	Query net weight
TAV?;	2000 CRLF	Tare value is 200.0

4.33 TDD LOAD/SAVE SETUP

Save or restore instrument settings.

General

No. of parameters	1
Save changes.	-
Increment Trade Counter	yes (TDD0 only)

Parameter Details

Parameter	Description	Range
1	command	0 Load ROM default values 1 Save current settings 2 Reload previous settings

Example:

S01;		Select unit 1
IDN"Site A"	0 CRLF	Set ID string
TDD1;	0 CRLF	Save settings

4.34 VAL? mV/V value query

If the instrument is operating in direct mV/V mode (see WMD command) this query returns the current mV/V signal strength. The returned value is such that 20000 = 2.0 mV/V.

General

No. of parameters	0
Save changes.	-
Increment Trade Counter	-
Response Time of command	
Response Time of query	

Example:

S01;		Select unit 1
VAL?;	5097CRLF	Current mV/V signal strength is 0.5097 mV/V.

4.35 WMD SET WEIGHING MODE

Set the weighting mode of the instrument. This selects between single range, dual range and dual interval weighing modes.

General

No. of parameters	2
Save changes.	With TDD1
Increment Trade Counter	yes

Parameter Details

Parameter	Description	Range	Default
-----------	-------------	-------	---------

1	Weighing mode	1	single range	1
		2	dual range	
		3	dual interval	
		4	direct mV/V	
2	Trade mode	0	Trade	0
		1	Industrial	

Use the WMD command to setup the weighing mode of the instrument. This setting is a fundamental scale build parameter and should be used along with the IAD and ICR commands before the unit is calibrated.

Example:

```
S01;                               Select unit 1
WMD?;      1,0 CRLF                Query current weighing mode
WMD2,1;    0 CRLF                  change to dual range, industrial mode
WMD?;      2,1 CRLF                weighing mode is dual range, industrial
TDD1;      0 CRLF                  save settings
```

4.36 ZST ZERO SETTINGS

Set the various options associated with zero balance.

General

No. of parameters 4
 Save changes. With TDD1
 Increment Trade Counter depends on parameter

Parameter Details

Parameter	Description	Range	Default	Trade Counter	
1	Zero on Startup	0	OFF	0	No
		1	ON		
2	Zero Tracking	0	OFF	0	Yes
		1	0.5d in 1sec		
		2	1.0d in 1 sec		
			
		12	5.0d in 0.2 sec		
3	Zero Range	1	-20% .. 20%	3	Yes
		2	-100% .. 100%		
		3	-2% .. 2%		
		4	-1% .. 3%		
4	Zero Dead Band	0..100000	0	Yes	

Example:

```
S01;                               Select unit 1
ZST?;      0,0,3,0 CRLF            Query current zero settings
ZST1;      0 CRLF                  Change to zero on startup
ZST,,,10;  0 CRLF                  Change Zero Dead Band to 10
ZST?;      1,0,3,10 CRLF          Query new settings
TDD1;      0 CRLF                  save settings
```

5. COMMAND SUMMARY

5.1 Set Scale Build

Command	Description	Page
IAD	Set max1,e1,max2,e2,decimal point,x10 mode	13
WMD	Select weighing mode	29
ENU	Select weight units	11
ICR	Set measurement frequency.	13

5.2 Calibration

Command	Description	Page
LDW	Calibrate Zero Dead Load	16
CWT	Set calibration weight	10
LWT	Calibrate Span	20
LIC	Linearisation	17
VAL?	mV/V signal strength query	29

5.3 Set Operating Parameters

Command	Description	Page
ASF	Set filtering options	6
COF	Set output format for MSV?	8
CLK	Set time & date	8
LBT	Button Lock	14
LIL	Set Labels for batch materials	17
LIS	Set batching parameters	18
LIV	Set parameters for the setpoints	18
MTD	Motion Setting	22
PFT	Printed Ticket Format String	22
PRS	Printer/Serial 2 Settings	22
PST	Set printer header	24
RBT	Remote Input Operation	25
ZST	Zero Settings	30

5.4 Set Communication Parameters

Command	Description	Page
ADR	Set unit address	5
BDR	Set communications parameters	6
IDN	Set unit identification	14
Sxx	Select unit for communication	27

5.5 General Commands

Command	Description	Page
CDL	Set Zero Dead Load.	8
PRT	Force print from serial 2	22
RES	Reset unit	25
STP	Stop continuous weight transmission	26
TAR	Tare unit	27
TAS	Select Gross or Net	28
TAV	Set numeric Tare	28
TDD	Save or restore units settings	29

5.6 Queries

Command	Description	Page
ESR?	Query error status	12
MSV?	Query weight readings	20

5.7 Basic Entry Level Communications

Command	Description	Page
Sxx	Select unit	27
COF	Set MSV Output Format	8
TDD	Save settings	29
MSV?	Query weight readings	20