



LS2000 / S.100 CODE READER USERS MANUAL

Software version of the described product:

LS2000 Terminal: 2.1.x

IB500 Interface: 1.5x

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INTRODUCTION

This documentation has been created with great care.

Nevertheless, progress in technology can cause changes of the product leading to deviations between this documentation and the actual product.

The content of this documentation, the technical data and the specifications of the product may be changed without prior notice.

This technical manual serves to assist the user and does not replace adequate education which is offered by W. H. Leary Ltd



FOREWORD

The Reading Head S.100 has been designed to identify binary Pharmacode. It is a so called "intelligent" sensor, i.e. the complete signal acquisition and evaluation requires no external device. The result is delivered via the serial interface. Exceeding state of the art technology it provides not only speed independent real dimension measuring but also multi-colour recognition. The S.100 is therefore capable to read multi-coloured Pharmacodes in a wide spectrum. Furthermore it is the fastest unit of its kind, reading True Pharmacode at up to 7 m/s.

The S.100 can be operated as a stand-alone system, transferring data to a host device via RS 232 interface. More often it will be connected to the Terminal LS2000, offering completely adapted menus to control multiple S.100 Reading Heads.

The S.100 offers a variety of diagnostic features, such as speed measuring, code dimensions, code position and print to cut registration.



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1. TECHNICAL DATA

1.1 Summary

GENERAL	
Optics	6-fold lens system
Light Source	4 x LED yellow, , 4 x LED blue
Pulse Frequency	50 kHz
Reading Distance	29 mm
Depth of Field	+/- 5 mm (at 0,5 mm resolution)
Resolution	up to 0,35 mm
Reading Speed	max. 7 m/s (420 m/min) at 0,5 mm resolution (Colour dependant)
Codes	Pharmacode, Mini-Pharmacode (with or without print to cut)
Trigger signal	external control or Auto-Trigger-Function
Display	Result of reading per LED, Trigger signal per LED
Interface	Serial RS 232
Trigger input	24 V optocoupled
Trigger output	24 V optocoupled
Power supply	24 V (DC)

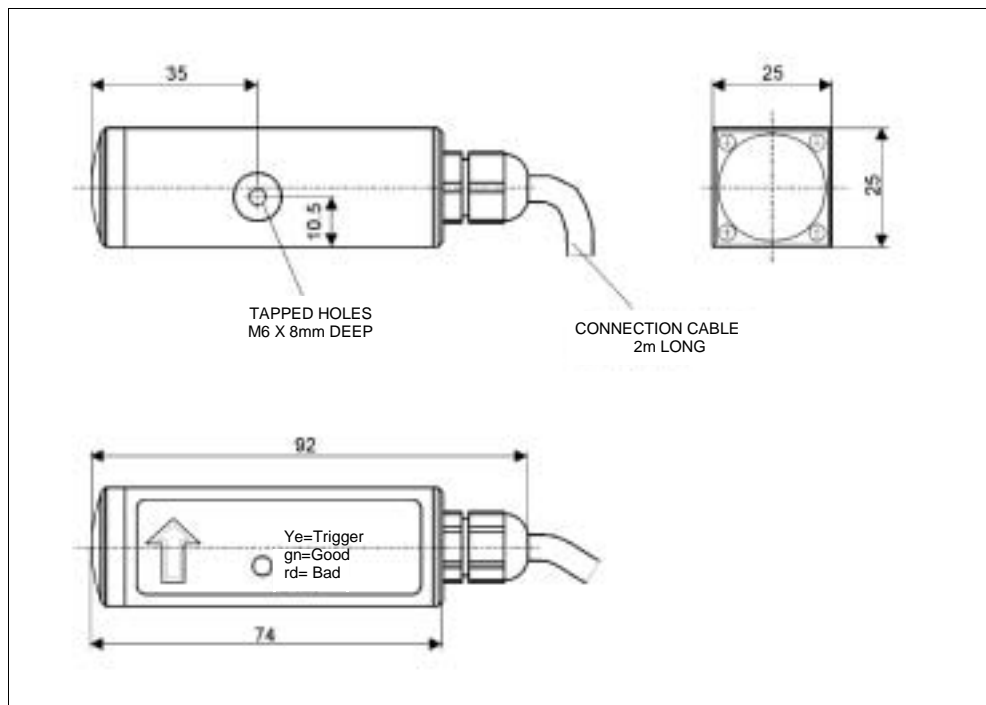


READING HEAD	
Housing Material	Aluminium, anodised
Dimensions	25 mm x 25 mm x 77 mm (w/o cable)
Fastening	2 threaded bores M4, 6 mm deep, 90° offset respectively 3 threaded bores M4, 5 mm deep at the back of sensor
Connector cable	fixed 2 m long with 12-pin male connector

INTERFACE-BOX	
Housing Material	Aluminium, anodised
Dimensions	60 mm x 60 mm x 112 mm (w/o plug)
Fastening	2 threaded bores M3, 6 mm deep
Connections	12-pin plug for sensor connection, 15-pin D-Sub plug for connection cable to connection box of LS2000 Terminal



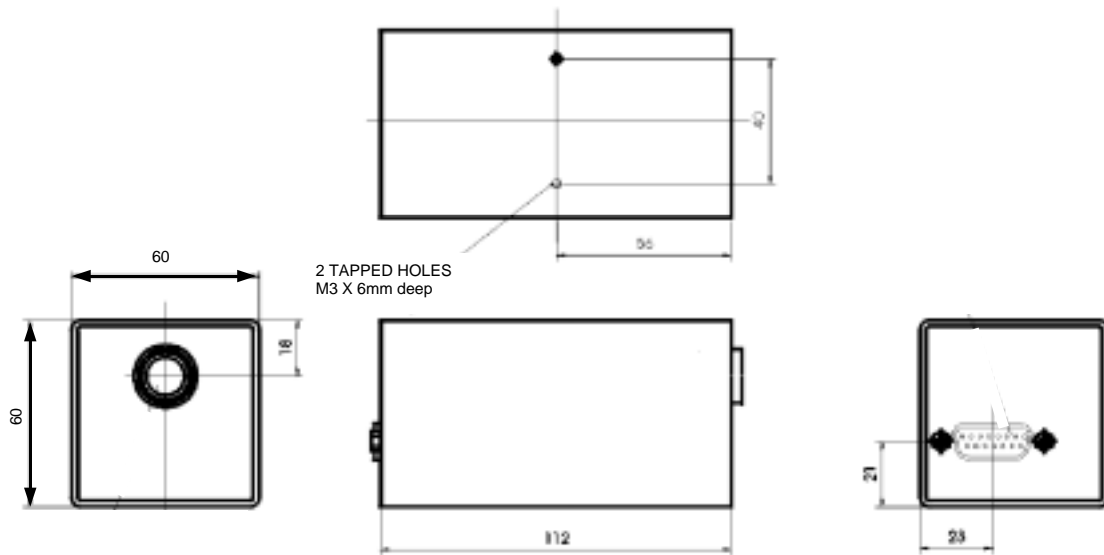
1.2 Dimensions of Reading Head



S.100 Colour Pharmacode Reader



1.3 Dimensions of IB500 Interface Box

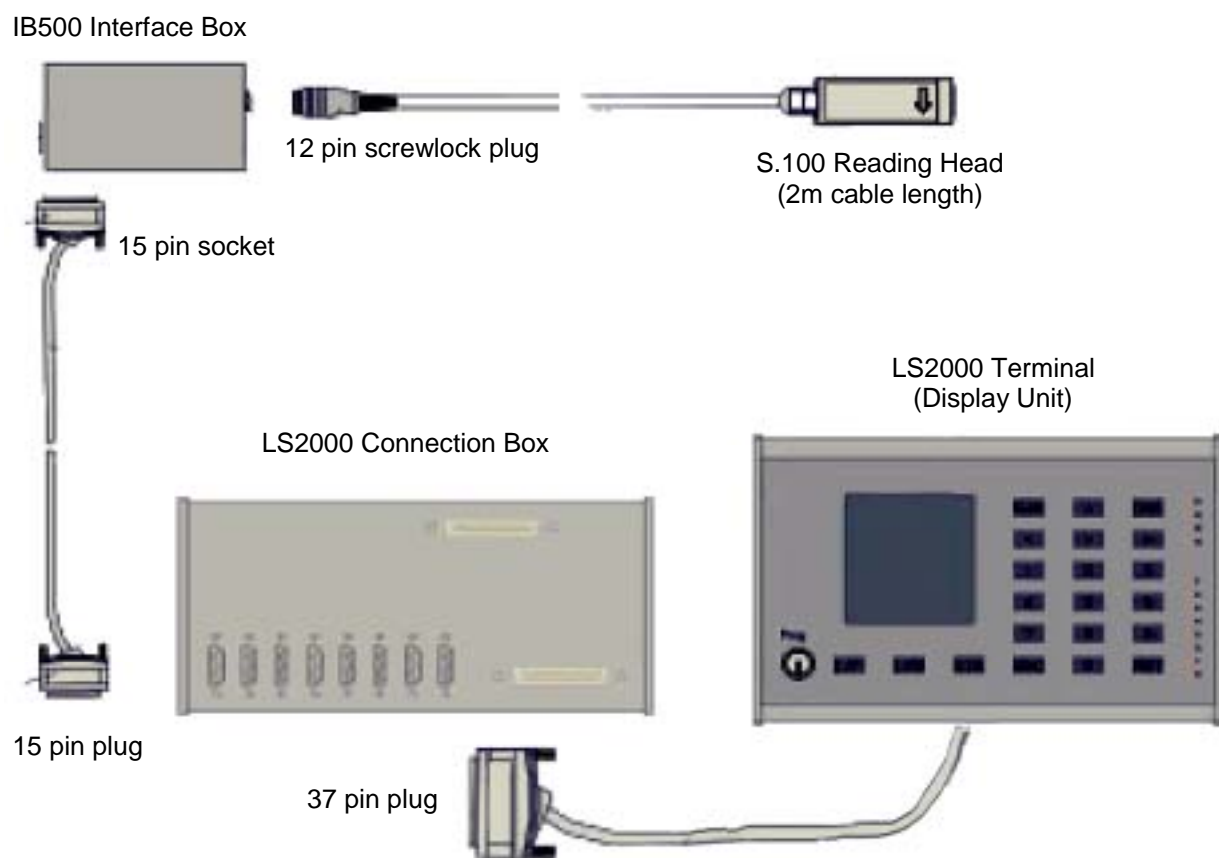




2. INSTALLATION OF THE LS2000 / S.100 SYSTEM

2.1 Connection of the S.100 to the Terminal LS2000

The connection between the S.100 and the Terminal LS2000 is shown in the following picture:





2.3 Alignment of Reading Head to Code

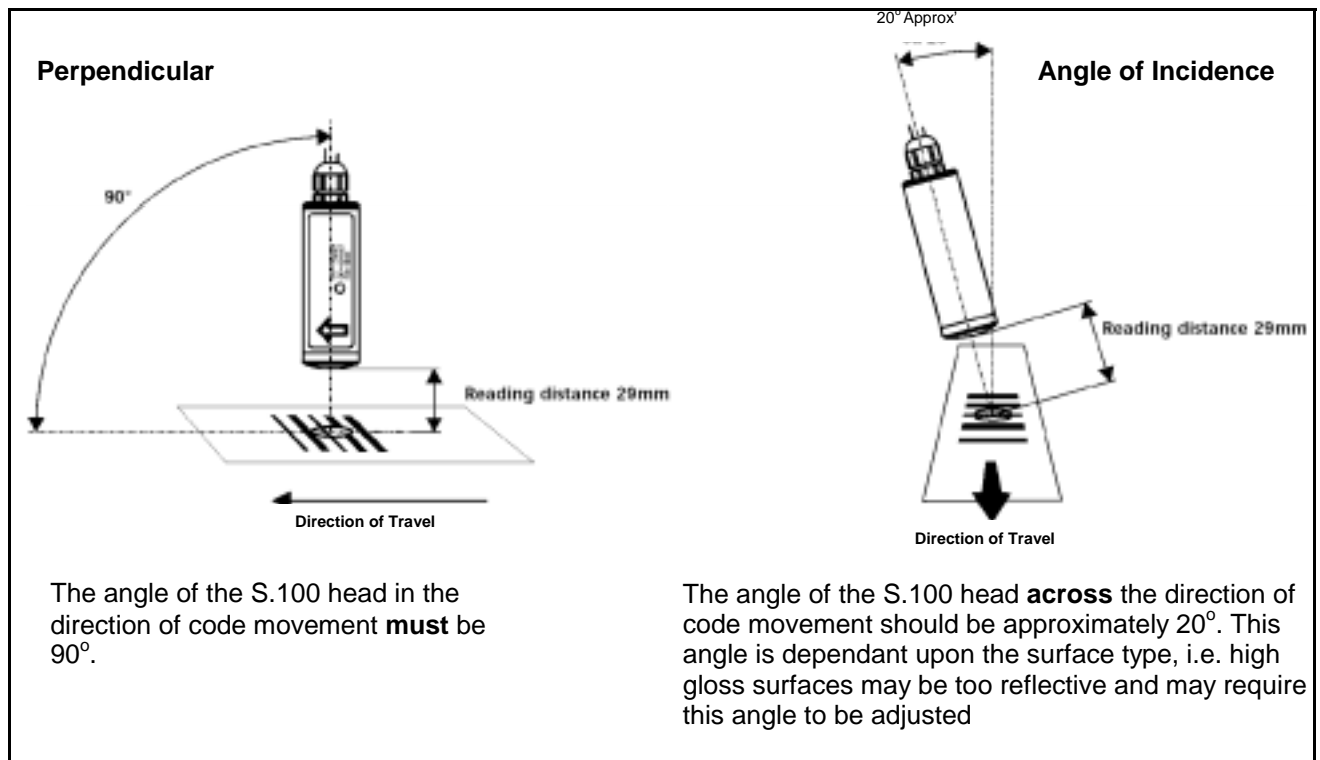
To achieve a reliable and faultless functioning of the Reading Head, it must be positioned correctly to the code.

When setting the head into position, please observe the following points:

1. The focal length (reading distance) is 29 mm.
2. The centre line of the reading head should be perpendicular (90 degrees) to the printed material in the direction of code travel. Please be careful not to twist the reading head during this adjustment.
3. The arrow on the body of the reading head must point either with or against the direction of travel, **not** across the code.

Note: On most folder gluers, where the S.100 is mounted on the operators side of the machine, the arrow points towards the feed (against the direction of travel).

4. To exclude read errors caused by reflective surfaces of the printed material, the S.100 is tilted at an angle of incidence of 20° across the carton.



Alignment and angle of incidence of Reading Head



2.4 Using the Setting Gauges

Setting gauges are supplied with each S.100 code reader head and can be used, as described below, to ease the setup of the head.

PAFRA SYSTEMS S100 CODE READER SETTING GAUGE	
<p>SETTING GAUGE, UNDERSIDE USE:</p> <p>SLIDE THE GAUGE ONTO THE TWO SCREWS ON THE BACK OF THE READING HEAD AND LINE UP THE POINT OF THE GAUGE WITH THE CENTRE OF THE CODE BARS, AS SHOWN. THE FLAT PART ON THE END OF THE GAUGE SHOULD BE ANGLED ONTO THE FLAP TO GIVE THE REQUIRED 20°</p>	<p>SETTING GAUGE, TOPSIDE USE:</p> <p>SLIDE THE GAUGE ONTO THE TWO SCREWS ON THE BACK OF THE READING HEAD AND LINE UP THE SHORTEST LENGTH OF THE GAUGE WITH THE CENTRE OF THE CODE BARS, AS SHOWN. THE FLAT PART ON THE END OF THE GAUGE SHOULD BE ANGLED ONTO THE FLAP TO GIVE THE REQUIRED 20°</p>



3 PROGRAMMING THE S.100 HEAD

When the S.100 head has been positioned correctly you will now need to program the LS2000 controller.

These steps consist of:

- Activating the required 'port' (No. 1 to 8) that you wish to use.
- Setting the 'Base Configuration' (Presets) for using the system.
- Configuring the 'Product Parameters' for the specific code you are running.
- Entering the 'Preset-Code Value' of the pharmacode you wish to read.

The Preset-Code is a copy of your Pharmacode, which **should** be read by S.100. It will be transmitted from the LS2000 Terminal to the IB500 Interface Box and there, it will be compared with the **Actual** Code read by the S.100 head. If both signals correspond a 'Good' signal is transmitted. If the signals do not match a 'Bad' signal is transmitted.

In the following programming instructions you shall be required to select between single menu points.

One way to achieve this is by means of the cursor keys "up" and "down" on the Terminal. The other way to do this is to press the respective number key (of the menu point) on the Terminal's numeric keypad, keys "0" to "9".

If you need to select 'T' for "Terminal", please press the numeric key "9".

Note: When a menu has been selected, unless a key is pressed, the display will return to the normal operating mode after 40 seconds.



3.1 Password Protection Screens:

To allow access to some areas of the LS2000 Terminal you will be required to enter passwords. There are five levels of password, two of which are available to the user.

Program mode	mode: 1		
Basicparameter	Sensor readi		
Passwort 1	Port	good	fai
*	1	0	0
	2	0	0
	3	1493	0
input	4	0	0
Ziffern 0-9	5	0	0
ESC - escape	6	0	0
	7	0	0
	8	0	0
LEARYSCAN	T	LearyScan	

When prompted for a password (as shown), use the numerical keypad, enter the required password and press enter.

The passwords are as follows:

- Password 1 = 1
- Password 2 = 2
- Password 3 = Engineer level only.
- Password 4 = Engineer level only.
- Password 5 = Engineer level only.



3.2 Port Activation on the LS2000 Terminal

1. Turn on the LS2000 Terminal. If the S.100 head has not been assigned to a port, you will see the screen shown:

Evaluation		mode: 1		
not used		Sensor readi		
		Port	good	fai
		1	0	0
		2	0	0
		3	0	0
		4	0	0
		5	0	0
		6	0	0
		7	0	0
		8	0	0
i685150		U	LearyScan	

2. Turn the key switch to the right until it stops. You are now in the Programming Mode of the Terminal.

Program mode		mode: 1		
Terminal		Sensor readi		
		Port	good	fai
1 System		1	2097	3189
2 PLC		2	0	0
3 Statistics		3	0	0
4 Productparam.		4	0	0
5 return (ESC)		5	0	0
		6	0	0
		7	0	0
		8	0	0
i40635		U	LearyScan	

3. Select 1 System.

4. Press Enter.

5. Select 2 Port assignment .

Program mode		mode: 1		
System		Sensor readi		
		Port	good	fai
1 Base config.		1	256	73
2 Portassignment		2	0	0
3 return (ESC)		3	0	0
		4	0	0
		5	0	0
		6	0	0
		7	0	0
		8	0	0
i68064		U	LearyScan	

6. Press Enter.

7. Select the connection (Port) to which you have connected the S.100 (Example Port 1). The status of the Reading Head is automatically set to "on".

(If for some reason you wish to turn this port "off", then press the left or right scroll key once at this point)

Program mode		mode: 1		
Port assignmen		Sensor readi		
		Port	good	fai
1 Free on		1	0	0
2 Free on		2	0	0
3 Free on		3	0	0
4 Free on		4	0	0
5 Free on		5	0	0
6 Free on		6	0	0
7 Free on		7	0	0
8 Free on		8	0	0
9 return (ESC)		9	0	0
i682625		U	LearyScan	

8. Press Enter.



9. Select 1 SB Scanner.

10. Press Enter.

Program mode		mode: 1		
Port occupat	1	Sensor readi		
Port	1	Port	good	fai
1 SB scanner		1	256	73
2 Scanner CLU440		2	0	0
3 Matrix camera		3	0	0
4 Scanner CLU410		4	0	0
5 Scanner CLU220		5	0	0
6 MAC340		6	0	0
7 others		7	0	0
8 Free		8	0	0
9 return (ESC)				
LEARYSCAN		LearyScan		

11. The S.100 is now assigned to the LS2000 Terminal.

Evaluation		mode: 1		
Port	1	Sensor readi		
SB Scanner	on	Port	good	fai
R: ■■■■■■	507	1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARYSCAN		LearyScan		



3.3 Setting the S.100 Base Configuration

The S.100 Base Configuration is basically a set of presets that define how the reading head is installed and what type of signals it sends and receives. These presets will be set up by a Leary engineer on installation and should not need to be changed. However, in some cases it may be necessary to adjust these settings. Listed below is the procedure for changing these presets:

1. Select the connection (Port) to which you have connected the S.100 (Example Port 1).

Evaluation		mode: 1		
Port 1	SB Scanner on 507	Port	good	fai
R: ■■■■■■		1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	

2. Turn key switch to the right until it stops.

3. You are now in the 'Programming Mode' of the Reading Head (Port No. 1)

Program mode		mode: 1		
Port 1	SB Scanner on 507	Port	good	fai
R: ■■■■■■		1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	

4. Select 1 Sensor.

5. Press Enter.

6. Select 1 Base configuration.

7. Press Enter.

Program mode		mode: 1		
Port 1	SB Scanner on 507	Port	good	fai
R: ■■■■■■		1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	



3.3.1 Trigger Source

The S.100 head uses a trigger to detect the front edge of the product. This trigger can be either supplied from an external sensor or generated internally from the head itself.

The system is easier to set if using the internal trigger, however sometimes false triggers can occur from heavy print marks or product “Flutter” (When the product lifts up and down excessively). In this case an external trigger, which will ignore these problems, will be used.

To change the Trigger source please carry out the following steps:

1. Highlight *Trigger* as shown.
2. Press Enter.

Program mode		mode: 1		
Configuration		Sensor readi		
SB Scanner 1		Port	good	fai
Trigger	auto	1	0	0
Trigger	positi	2	0	0
Output	positi	3	0	0
Pulse length	10ms	4	0	0
Output	fail	5	0	0
Run-directi	to Arr	6	0	0
Readdirectio	forw.	7	0	0
ESC - escape		8	0	0
B B B		T	LearyScan	

3. Highlight the required trigger source where “extern” is the external trigger and “Auto” is the internal trigger.
4. Press Enter. The selected trigger function is now active.

Program mode		mode: 1		
Configuration		Sensor readi		
SB Scanner 1		Port	good	fai
Trigger	extern trigger	1	0	0
Trigger	Auto-trigger	2	0	0
Output	positi	3	0	0
Pulse length	10ms	4	0	0
Output	fail	5	0	0
Run-directi	opos.	6	0	0
Readdirectio	forw.	7	0	0
ESC - escape		8	0	0
B B B		T	LearyScan	



3.3.3 Output Polarity

NOTE: This setting does not require changing when the S.100 is used in conjunction with the LearyScan LS2000 Terminal.

Please contact Leary Technical Department for more information if required.

If the S.100 head is connected to a LS2000 Terminal then the “Output Polarity” **must** be set to “Positive”.

If, for some reason, it has been altered then follow these steps to return this setting to positive:

1. Highlight *Output* as shown.

2. Press Enter.

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
Trigger	auto	Port	good	fai
Trigger	positi	1	0	0
Output	positi	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	to Arr	5	0	0
Readdressio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	

3. Select *1 positive*.

4. Press Enter.

5. The “Output Polarity” has now been returned to the correct “Positive” setting.

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
Trigger	auto	Port	good	fai
Trigger	positi	1	0	0
Output	positi	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	to Arr	5	0	0
Readdressio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	



3.3.4 Pulse Length

The “Pulse Length” is the duration of the good / bad signal from the S.100 head measured in mS (Milliseconds) and should be set to a standard of 10mS.

NOTE: This setting should not need to be changed.

If the “Pulse Length” is too long then the S.100 head may still be giving an output for the previous product when it should be reading the next product. This will result in the code reader missing every other product.

To reset this function back to 10 mS please carry out the following steps:

1. Highlight *Pulse Length* as shown.
2. Press Enter.

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
Trigger	auto	Port	good	fai
Trigger	positi	1	0	0
Output	positi	2	0	0
Pulse length	20ms	3	0	0
Output	fail	4	0	0
Run- directi	to Arr	5	0	0
Readdressio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	



3. Press Edit to clear the current value (shown as “20” above).



4. Press 10 on the numeric keypad.



5. Press Enter.



3.3.5 Output (Fail / Device Ready / Trigger)

NOTE: This setting does not require changing when the S.100 is used in conjunction with the LearyScan LS2000 Terminal.

Please contact Leary Technical Department for more information.

The default setting for this preset is “Fail” (Bad Signal), however, if for some reason this setting has been changed please follow the guidelines below to reset this function:

1. Highlight the 2nd *Output* listed on the menu as shown.
2. Press Enter.

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
Trigger	auto	Port	good	fai
Trigger	positi	1	0	0
Output	positi	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	to Arr	5	0	0
Readdressio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	

3. Highlight 1 *Bad-signal*
4. Press Enter

Program mode		mode: 1		
output-Signa		Sensor readi		
- 1	Bad-signal	Port	good	fai
- 2	Device ready	1	0	0
(3	int. Trigger	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	opos.	5	0	0
Readdressio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	



3.3.6 Running Direction (Direction of Travel)

Marked on the body of the reading head is a yellow arrow. This tells you which direction the code is travelling in relation to the S.100 head and needs to be programmed into the LS2000. The S.100 reading head is able to read code in two directions, either **in** the direction of the marked arrow or **against** the direction of the arrow.

Upon initial installation this setting will be programmed by the Leary engineer, however, If the S.100 is relocated on your application it may be necessary to change the run direction setting. To do this please follow the instructions below:

1. Highlight *Run direction* as shown.

2. Press Enter.

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
Trigger	auto	Port	good	fai
Trigger	positi	1	0	0
Output	positi	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	to Arr	5	0	0
Readdirectio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0
LEARYSCAN		T LearyScan		

3. Select the required setting:

- If the code travels in the **same** direction as the arrow select *1 to Arrow*
- If the code travels in the **opposite** direction to the arrow select *2 opos. arrow*.

4. Press Enter

5. The "Run Direction" has now been set.

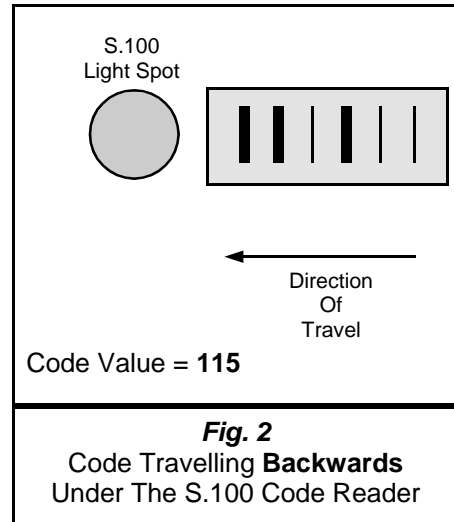
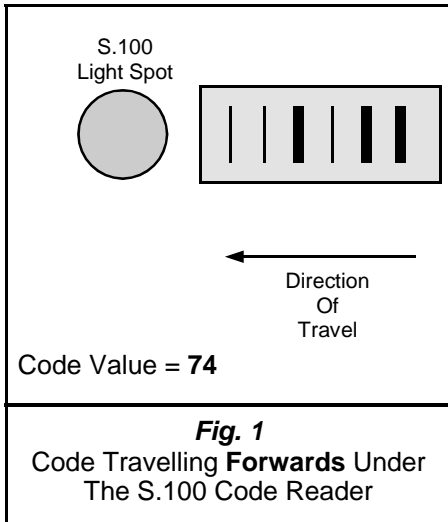
Program mode		mode: 1		
Run-directi		Sensor readi		
= 1 to Arrow		Port	good	fai
- 2 opos. Arrow		1	0	0
Output	positi	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	opos.	5	0	0
Readdirectio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0
LEARYSCAN		T LearyScan		



3.3.7 Read Direction

Pharmacode is evaluated as a binary value known as the code value. The code can be read in either direction although the code value will be different if it is read backwards.

Eg.



If the situation occurs where perhaps the code has been printed backwards or the product has to be fed backwards, then the LS2000 Terminal can be set to read the code, invert the code and display the correct code value.

This function is known as the “Read Direction” and can be changed by the following method:

1. Highlight *Read direction* as shown.
2. Press Enter.

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
Trigger	auto	Port	good	fai
Trigger	positi	1	0	0
Output	positi	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	to Arr	5	0	0
Readdirectio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0

3. Select the required function:

- If the code is in the correct orientation then select *1 forward*
- If the code is backwards then select *2 reverse*.

Program mode		mode: 1		
Readdirectio		Sensor readi		
= 1 forward		Port	good	fai
- 2 reverse		1	0	0
Output	positi	2	0	0
Pulse length	10ms	3	0	0
Output	fail	4	0	0
Run-directi	opos.	5	0	0
Readdirectio	forw.	6	0	0
ESC - escape		7	0	0
		8	0	0

4. Press Enter. The code read in **Fig. 2** above, will now be read as code value = 74. (Please note that the code value in **Fig. 1** will also be reversed and will now read 115.)



3.3.8 Naming the Port

You have now completed setting the “Base Configuration” for the S.100 Code Reader.

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
		Port	good	fai
Trigger	auto	1	0	0
Trigger	positi	2	0	0
Output	positi	3	0	0
Pulse length	10ms	4	0	0
Output	fail	5	0	0
Run-directi	to Arr	6	0	0
Readdressio	forw.	7	0	0
ESC - escape		8	0	0
BBB&B		T	LearyScan	

When “ESC - escape” is highlighted and Enter is pressed the next screen will allow you to change the name of the port. The default for this name is “Port 1”. If you wish to keep this name the same, press Enter and the display will return to the main screen.

Program mode		mode: 1		
Port 1		Sensor readi		
		Port	good	fai
_ort	1	1	0	0
RET acknowledge		2	0	0
Edit, Del, Cursor		3	0	0
ESC - escape		4	0	0
		5	0	0
		6	0	0
		7	0	0
		8	0	0
BBB&B		T	LearyScan	

To change the name of this port, press Edit to delete all of the text. Now use the alpha numeric keypad to enter the required name. When this is complete, press Enter to return to the main screen.

A line with a length of max. 16 characters is at your disposal for text entry.

The set of characters include:

- Capital letters A to Z
- Small letters a to z
- Digits 0 to 9
- various special characters (Space = F1-key).

With the "up" and "down" keys you can scroll through the set of characters forwards and backwards, with the "left" and "right" keys you reach the next character in the text line.

Continuous pressing of key causes a rapid run through.

With the “Edit” key you delete the whole message text all at once, with the “Del” key the character to the left of the cursor is deleted.



3.4 Setting The S.100 Product Parameters

1. Select connection (Port), to which you have connected the S.100 (here Port 1).

Evaluation		mode: 1		
Port 1	SB Scanner on 507	Port	good	fai
R: ■■■■■■		1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
iBB10P29		T	LearyScan	

2. Turn the key switch to the right until it stops. You are now in the Programming Mode of the Reading Head.

3. Highlight 1 Sensor.

4. Press Enter.

Program mode		mode: 1		
P	Program mode	Port	good	fai
St	Port 1	1	0	0
R:	1 Sensor	2	0	0
nc	2 new code	3	0	0
nc	3 return (ESC)	4	0	0
		5	0	0
		6	0	0
		7	0	0
		8	0	0
	not used			
iBB10P29		T	LearyScan	

5. Select 2 Productparamet.

6. Press Enter.

Program mode		mode: 1		
SB Scanner	Port 1	Port	good	fai
1 Base config.		1	0	0
2 Productparamet		2	0	0
3 Service/test		3	0	0
4 return (ESC)		4	0	0
		5	0	0
		6	0	0
		7	0	0
		8	0	0
	not used			
iBB10P29		T	LearyScan	



3.4.1 Type of Code

9. Select 1 *Pharmacode* (as shown) or 2 *Mini Code*. (3 *Special Code* is for future use and is not available)
10. Press Enter.

Program mode		mode: 1		
P	Kind of Code	Sensor readi		
St	1 Pharmacode	Port	good	fai
R:	2 MiniCode	1	0	0
ht	3 specialcode	2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	

NOTE: Mini Code is simply a smaller version of true pharmacode where the bar widths and quiet zone are thinner by a factor of 0.7. The LS2000 is factory set for the correct bar widths for 'True' Pharmacode and Mini Code respectively.

However, it is common practice for the pharmacode bar widths to be printed thicker than the actual 'True' Phamacode specification dictates. This gives the S.100 head more time to read the bars and therefore allows for faster machine speeds to be used in production.



3.4.2 Threshold Voltage (To skip this parameter, press Enter)

The Threshold Voltage is the switching point of the S.100 head and can be used to ignore interference or pollution on the product. (such as slight print bleed or translucent surfaces).

The switch point can be raised from 1 to 255 and has a default of 1. This setting is the most accurate and will detect low contrasts eg. pale pastel colours on white backgrounds.

If, however there is good contrast in the bars eg. Black bars on white background, but the bars are smudged, there maybe a chance that the head will read the code bars inaccurately and inconsistently.

To try to rectify this the Threshold Voltage level can be raised. There are no fixed settings for this function as the level of interference on the code will vary for all jobs and is really a case of "trial and error" to achieve the best setting. However as long as the background of the code remains clean and free from marks with a good contrast to the bars this setting will not need to be changed from the default of 1.

To change the threshold voltage:

1. Press the Edit-key. This will clear the current value.
2. Enter, via the numeric keys "0" to "9" on the Terminal, a voltage value between 1 and 255 according to your requirements.
3. Press Enter to set the new value.

Program mode		mode: 1		
Voltage Level		Sensor readi		
Level		Port	good	fai
from 1- 255		1	0	0
EDIT alter		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
[F1] [F2] [F3]		T	LearyScan	



3.4.4 Print to Cut (On / Off) (To skip this parameter, press Enter)

The print to cut mark is an equilateral triangle found at the back of **some** types of Pharmacode. It's use is to allow the code reading head to also check for any movement of the carton's print in relation to the cartons die cutting.

Although this feature gives the added benefit of checking another quality process within the code reading operation it is essential that the product is contained in the machine firmly and consistently. Any sideways movement or "Flutter" (Up and down movement) can cause misreads and inconsistent results.

If the code you wish to read has a Print to Cut mark at the back of the code, this feature **must** be turned **On**.

If the code you wish to read does not have a Print to Cut mark at the back of the code, this feature **must** be turned **Off**.

To adjust this feature:

1. Highlight the required setting:

- *1 on* if the code has a print to cut mark.
- *2 off* if the code does not have a print to cut mark.

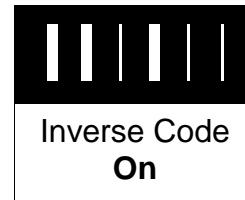
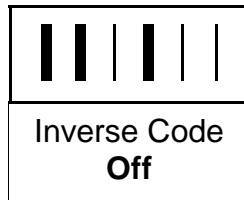
2. Press Enter.

Program mode		mode: 1		
P	print to cut	Sensor readi		
St	1 on	Port	good	fai
R:	2 off	1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
HELP	T	LearyScan		



3.4.5 Inverse Code (on/off) (To skip this parameter, press Enter)

The Inverse Code feature enables the S.100 head to read code in a “Negative” view. Eg. White code bars on a black background.



To change this function:

1. Highlight the required setting.

- *1 on* for a dark background with light code bars.
- *2 off* for a light background with dark code bars (Preferred option).

2. Press Enter.

Program mode		mode: 1		
P	Inverscode	Sensor readi		
St	1 on	Port	good	fai
R:	2 off	1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARYSCAN		T	LearyScan	



3.4.6 Evaluation Strategy (To skip this parameter, press Enter)

NOTE: This setting does not require changing and should be left on “Average Speed”

Please contact Leary Technical Department for more information if required.

This function involves the method that the S.100 head uses to evaluate the code. High speed machines, such as carton folder gluers, should always use the “Average Speed” setting.

If this setting has been changed please follow the guidelines below to return this setting to “Average Speed”:

1. Highlight *1 average speed*.
2. Press Enter.

Program mode		mode: 1		
P	evalua.strat	Sensor readi		
St	1 average speed	Port	good	fai
R:	2 separate Bar	1	0	0
no	not used	2	0	0
		3	0	0
		4	0	0
		5	0	0
	not used	6	0	0
		7	0	0
		8	0	0
LEARYSCAN	T	LearyScan		



3.4.7 Time for Output (To skip this parameter, press Enter)

NOTE: This function is not used on the majority of machines and should always be set to “After Trigger”.

Please contact Leary Technical Department for more information if required.

This feature allows the system to transmit the Good/Bad signal either at the end of the trigger pulse or at the start of the next code. The “After Bar” setting is only used on special rotary application machines and allows the product to be stopped at a specific orientation.

If this setting has been changed, please follow the guidelines below to reset it to “After Trigger”.

1. Highlight 1 After Trigger.
2. Press Enter.

Program mode		mode: 1		
P	time for out	Port	good	fai
St	1 after trigger	1	0	0
R:	2 after bar	2	0	0
no read		3	0	0
not used		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARY		T	LearyScan	



3.4.8 Configuration (To skip this parameter, press Enter)

(Width of Code Bars / Quiet Zone / Print to Cut Register)

The Configuration screen allows you to define the tolerances set for the widths of the code bars. It also allows the user to specify the tolerance on the Print to Cut register (If turned on) and the size of the quiet zone.

The configuration screen will only show the Print to Cut options if you have "Print to Cut" turned **on**:

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
thick Bar max	400	Port	good	fai
thick Bar min	215	1	0	0
thin Bar max	210	2	0	0
thin Bar min	20	3	0	0
Quiet Zone	400	4	0	0
ESC - escape		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
LEARYSCAN		T LearyScan		

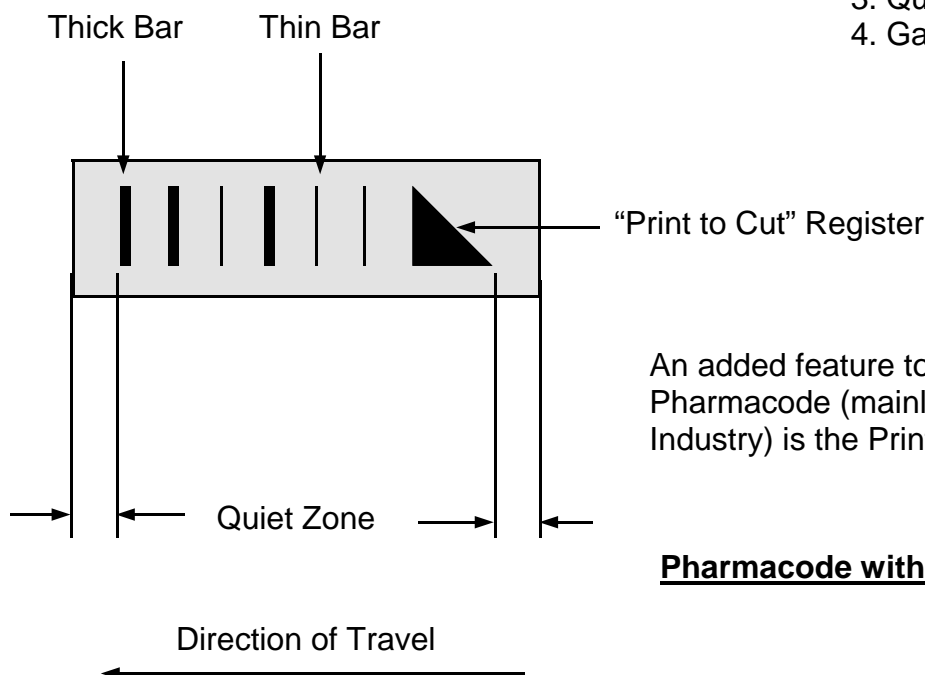
Configuration Screen
(Print to Cut: **OFF**)

Program mode		mode: 1		
Configuration SB Scanner 1		Sensor readi		
thick Bar max	400	Port	good	fai
thick Bar min	215	1	0	0
thin Bar max	210	2	0	0
thin Bar min	20	3	0	0
Quiet Zone	400	4	0	0
min print t c V	200	5	0	0
max print t c V	400	6	0	0
Print t.cut min	1	7	0	0
Print t.cut max	100	8	0	0
ESC - escape				
LEARYSCAN		T LearyScan		

Configuration Screen
(Print to Cut: **ON**)

A True Pharmacode consists of four key components:

1. Thin Bars (0.5mm)
2. Thick Bars (1.5mm)
3. Quiet Zone
4. Gap between bars



An added feature to some types of Pharmacode (mainly in the carton Industry) is the Print to Cut Register

Pharmacode with Print to Cut Register



3.4.8.1 Width of Bars

In general the thicker the bars, the quicker the code reader can run. (Up to the limits as specified in the technical specifications)

Because of this, many companies increase the widths of the code bars from True Pharmacode for faster running. So the LS2000 allows the user to pre-define the widths of the code bars in use.

To change the tolerance settings for the thick or thin bars:

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

1. Highlight the required setting (As above).

```

Program mode
Configuration
SB Scanner 1
Max. Wide
thick Bar 400
0.01mm* >>
EDIT alter
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

```

Program mode
Configuration
SB Scanner 1
Max. Wide
thick Bar -
0.01mm* >>
EDIT alter
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

```

Program mode
Configuration
SB Scanner 1
Max. Wide
thick Bar 375
0.01mm* >>
EDIT alter
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

```

Program mode
Configuration
SB Scanner 1
thick Bar max 375
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape
  
```

2. Press enter.

3. Press edit to clear the current value.

4. Using the keypad, enter the desired value.

5. Press enter to store this value.

Note: All of the dimensions on this screen **except** “Print t. cut min” and “Print t. cut max” (Print to cut ‘X’ Axis) are programmed in 1/100th of a millimetre:

- i.e. 4mm is entered as 400.

“Print t. cut min” and “Print t. cut max” (Print to cut ‘X’ Axis) are currently programmed in 1/10th of a millimetre:

- i.e. 4mm is entered as 40.



3.4.8.2 Quiet Zone

The Quiet Zone is an area of clear space, the same colour as the background, located before and after the code bars. The quiet zone enables the S100 to confirm the start and end position of the code and also allows it to ignore other markings or print that may be evaluated as an incorrect code. The recommended width of the Quiet Zone is 4mm or greater. However if for some reason this cannot be achieved then this setting can be reduced to a minimum of 2.5mm.

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

Note: The running speed of the code may need to be reduced if the Quiet Zone is less than 4mm.

To change the Quiet Zone setting:

1. Highlight *Quiet Zone* as shown above.

```

Program mode
Configuration
Quiet Zone
0.01mm* >> 400
EDIT alter
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

2. Press Enter

```

Program mode
Configuration
Quiet Zone
0.01mm* >> -
EDIT alter
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

3. Press Edit to erase the current value

```

Program mode
Configuration
Quiet Zone
0.01mm* >> 300
EDIT alter
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

4. Using the keypad, enter the desired value.

5. Press Enter to store the new value.

Note: The Quiet Zone setting is measured in 1/100 mm.

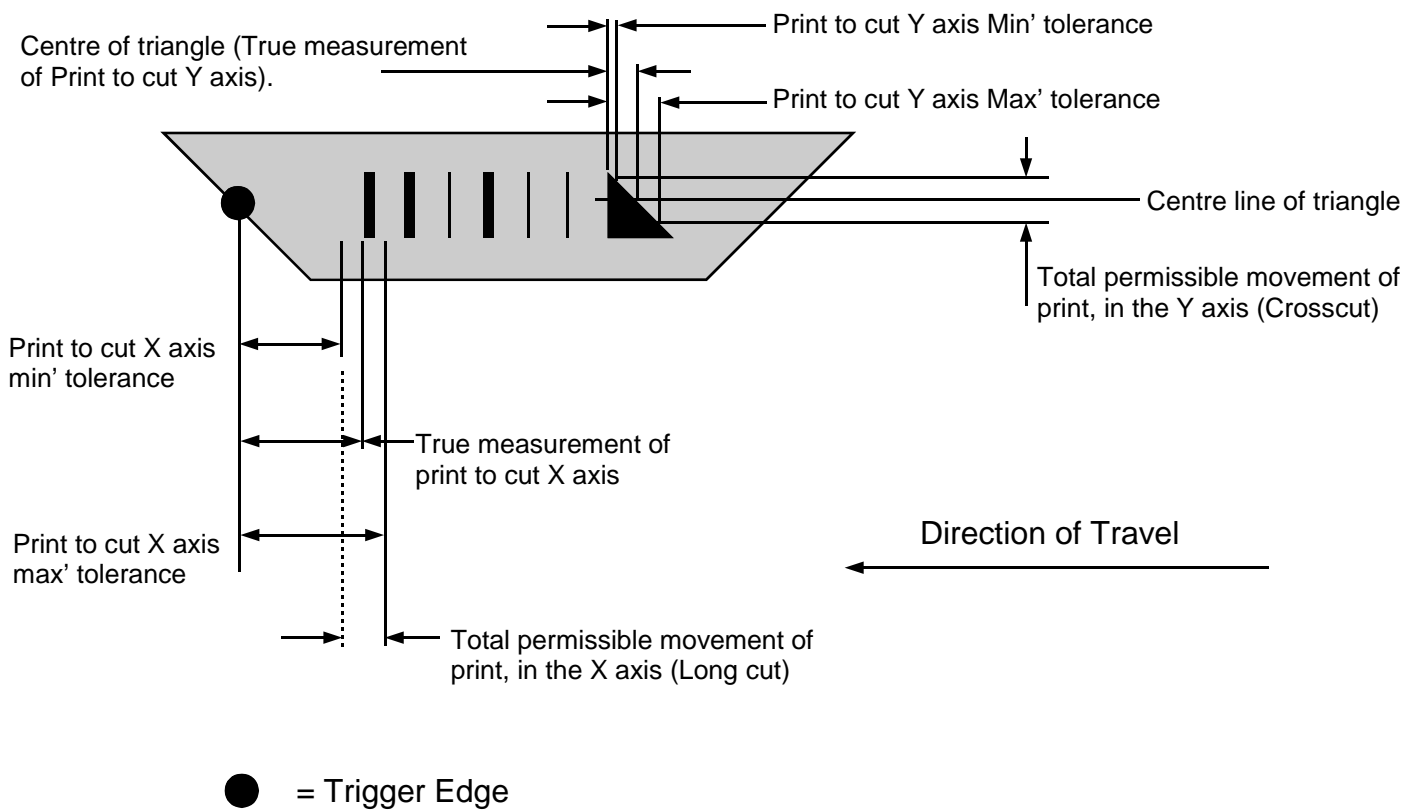
- eg. 400 = 4mm



3.4.8.3 Print to cut Register

The Print to Cut register is used in some industries (Primarily carton converting) to confirm the position of the print to the die-cutting of the carton.

The method used to check this function is an equilateral triangle, positioned at the back of the code. The reader head measures the triangle and position of the code as follows:



Note: Print to cut 'Y' Axis, Max' and Min' are programmed in 1/100th of a millimetre:

- i.e. 4mm is entered as 400.

Print to cut "X" Axis, Max' and Min' are programmed in 1/10th of a millimetre:

- i.e. 4mm is entered as 40.



To adjust the Print to cut settings follow the instructions below:

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

1. Highlight the required setting (As above).

```

Program mode
max print t
0.01mm* >> 100
EDIT alter
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

2. Press enter.

```

Program mode
max print t
0.01mm* >> -
EDIT alter
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

3. Press edit to clear the current value.

```

Program mode
max print t
0.01mm* >> 300
EDIT alter
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 100
ESC - escape

```

4. Using the keypad, enter the desired value.

```

Program mode
Configuration
SB Scanner 1
thick Bar max 400
thick Bar min 215
thin Bar max 210
thin Bar min 20
Quiet Zone 400
min print t c Y 200
max print t c Y 400
Print t.cut min 1
Print t.cut max 300
ESC - escape

```

5. Press enter to store this value.

Note: Print to cut 'Y' Axis, Max' and Min' are programmed in 1/100th of a millimetre:

- i.e. 4mm is entered as 400.

Print to cut "X" Axis, Max' and Min' are programmed in 1/10th of a millimetre:

- i.e. 4mm is entered as 40.



3.5 Entering A New Code (Code Value)

When the base configuration and Product Parameters have been set the user now needs to enter the required code.

To do this follow the instructions below:

1. Highlight the Port No. for the code reader that you wish to use. (Port No. 1 if you only have one S100 head connected, as shown).

Evaluation		mode: 1		
Port	1	Sensor readi		
SB Scanner	on	Port	good	fai
R: ■■■■■■	507	1	0	0
no read		2	0	0
not used		3	0	0
		4	0	0
		5	0	0
not used		6	0	0
		7	0	0
		8	0	0
■■■■■		T LearyScan		

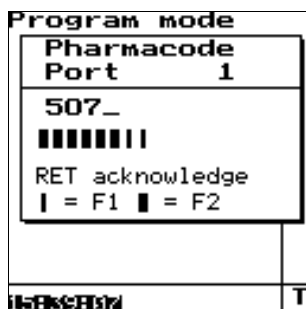
2. There are now two possible methods of inputting the code, please follow one of the methods listed below:

Method 1

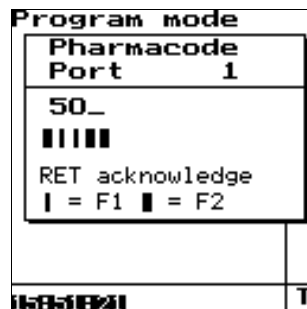
or

Method 2

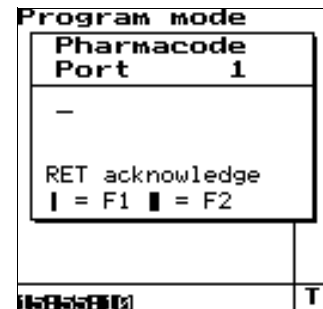
- | | |
|---|---|
| <ul style="list-style-type: none"> • Press the code button. • Enter password No. 1. • Press Enter. | <ul style="list-style-type: none"> • Turn the Keyswitch. • Select 2 <i>New Code</i>. • Press Enter. • Enter Password No. 1. • Press Enter. |
|---|---|



3. Delete the old code:



4. Press Del to erase one figure at a time.



5. Press Edit to erase the whole code completely.



6. Now enter the new code. There are also two methods of doing this, as follows:

Method 1

or

Method 2

- The buttons F1 and F2 represent thin bars and thick bars respectively.
 - Press the required buttons to duplicate the code.
 - Press Enter.
- Using the keypad, enter the numerical value of the code.
 - Press Enter.



4 MONITORING OF SENSOR READINGS

4.1 The Status LED's of the S.100

During the running process you can now, among other things, monitor the sensor readings by means of the three light-emitting diodes (LEDs), which are located on the back of the IB500 Interface Box.

They show the following information:

LED Status of Interface Box	Description
● Yellow	Trigger signal received / generated
● Green	Good signal (Code recognised)
● Red	Bad signal (Code not recognised)



4.2 The Status LEDs of the Terminal LS2000 (Display Screen)

The three LED's located on the front panel of the LS2000 display, labelled "Trig", "OK", and "Fail" allow the user to monitor the status of the currently selected sensor. i.e. If Port No. 1 is highlighted, the LED's refer to the sensor that is connected to Port No. 1.

They show the following information:

LED Status of Interface Box	Description
Yellow	Trigger signal sent to sensor
Green	Receiving Good signal (Code recognised)
Red	Receiving Bad signal (Code not recognised)

Note:

- The LED's "Trig", "OK" and "Fail" will only work, if you have turned on the Code Display (as described in Section 3.4.3, page no. 29).
- If the sensor uses an external trigger, the "Trig" LED may not function.



4.3 The Display of the Terminal LS2000

When in use, the system allows you to view a number of statistics and readings which tell the user how the sensor is evaluating the code.

To scroll through these statistics follow the instructions below:

Highlighted Port

1. Highlight the Port No. that you wish to monitor.

2. Using the “left” or “right” cursor key scroll across to view the data as shown on the following pages:

Evaluation		mode: 1		
Port 1	SB Scanner on	1	0	0
R: ■■■■■■	507	2	0	0
no read		3	0	0
not used		4	0	0
		5	0	0
		6	0	0
not used		7	0	0
		8	0	0
Sensor readi		Port good fai		
LearyScan		T		

Note: To avoid false reads it is not recommended to scroll through the following screens whilst the machine is in production. Please leave the controller displaying the code display screen, as shown above, when the system is in use.



4.3.1 Display of Actual Code

After you have entered the New Code as described in Section 3.2, it is displayed both graphically and numerically on the display of the LS2000.

The display shows two codes:

R : The “Required” code. This is the code that has been entered by the user.

A : The “Actual” code. This is the code that the S.100 code reader is currently reading.

Evaluation	
Port	1
SB Scanner	on
R:	507
A:	507
not used	
not used	
not used	
not used	
not used	
not used	

Note: The code display will only be updated if you have this function turned on as, described in 3.4.3, page no. 29.

4.3.2 Statistics Counters

From the main screen, press the right cursor key once to show this display:

The counters display how many good and bad codes the S.100 head has detected since they were last reset.

Evaluation	
Port	1
SB Scanner	on
Good:	543
Fail:	1
not used	
not used	
not used	
not used	
not used	
not used	

Note: To reset these counters please follow the instructions as described in 4.3.9, page no. 51.



4.3.6 Bar Width Display

From the main screen, press the right cursor key five times to show this display:

The “Bar Widths” screen allows you to check the widths of the thick and thin bars that the sensor has read. These figures can change for reasons such as:

- Poor print quality
- High speed applications
- Fast acceleration / deceleration
- Flutter

Evaluation	
Port 1	II
SB: Scanner on	
Thick bar : 2,86mm - 3,40mm	
Thin bar : 0,90mm - 1,14mm	
not used	
not used	
123456789	T

The example shows:

- Thick bar lower measurement: 2.86 mm
- Thick bar upper measurement: 3.40 mm
- Thin bar lower measurement: 0.90 mm
- Thin bar upper measurement: 1.14 mm

From these readings you can now confirm that the tolerance levels that have been set in the Product Parameters Configuration Screen, as described in 3.4.8.1, page no. 35, are correct.

Note: This display will be updated for “good reads” only. For this reason, on initial set-up, it’s good practice to set the bar width tolerances, as described in 3.4.8.1, page no. 35, at fairly wide limits. Then, when good reads are achieved, these tolerances can be “tightened up” if required.

