Photonis 0387 HSB MRTS Anode Repair Software User Manual

Micro-Key
Embedded Technology Experts

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1 Introduction

1.1 Scope

This document describes the end-user functionality of the Photonis HSB module repair test set. It gives detailed overview over the menu structure and explains the interactivity between user and device.

1.2 References

[1] Document somename, vvv
Micro-Key, dd-mm-yyyy

1.3 Definitions

TBD To Be Defined

2 System overview

Interaction between user and system occurs via two devices which are part of the HSB module repair test set.

2.1 Display

Visual feedback and information is provided to the user through a display. It contains four rows with 20 characters each.

Figure 1: New heaven display NHD-0420D3Z-FL-GBW-V3

Within this document the display content is related to by a table. Below represents the display seen from left to right and up to down as a matrix of 4x20.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2																				
3																				
4																				

As example, the table below represents the same display content as in *Figure 1*.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	S	c	h	e	d	u	l	e	:		M	o	n	.	-		F	r	i	.
2	O	p	t	i	o	n	s		P	r	e	s	e	t	:		A	2	1	
3	A	u	t	o	-	o	f	f	:		N	O								
4	A	c	c	e	s	s	:		P	u	b	l	i	c						

2.2 Keypad

The system contains a keypad which represents the only possibility for the user to interact with the several functions of the system.

Figure 2: 16-key keypad

The keypad consists of a matrix of four by four keys, making it 16 keys totally. They are labelled as follows:

0-9	Numeric keys 0 - 9
←	Arrow left
↑	Arrow up
→	Arrow right
↓	Arrow down
ENT	Enter
X	Escape

3 Service manual

3.1 Selection cursor

As soon as a menu with selectable items appears on the display there must be a cursor/selector to differ between the currently highlighted menu item and other items.
The cursor is character: >
The cursor is always in first position of the current row, followed by a blank (space character).
For example, the cursor active in third row with random text behind looks like:

/	1	2	3	4
1	R	a	n	d
2			1	.
3	>		2	.
4			3	.

3.2 Start screen

After powering the system, the display will become active and print out a start message, containing the type of assemblage and version number.

For anode repair repair set:

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	A	n	o	d	e		r	e	p	a	i	r								

A full start message on display, containing the system version number, will look like:

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	A	n	o	d	e		r	e	p	a	i	r								
2																				
3					S	W		V	.		1	.	0	.	0	.	0			
4																				

There is no user-action needed at this point – the system will switch to the main menu as soon as the system is fully booted and functional.

3.3 Main menu

After booting, the system switches to the main menu.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	A	n	o	d	e		r	e	p	a	i	r								
2	>		1	.	T	u	b	e		r	e	p	a	i	r					
3			2	.	A	d	m	i	n	i	s	t	r	a	t	o	r			
4			3	.	C	a	l	i	b	r	a	t	i	o	n					

Note: The item 2 and 3 are PIN protected.

1-3	Select item 1-3 respectively
↑	Move cursor up one line
↓	Move cursor down one line
ENT	Select currently current item
others	No function

3.3.1 Anode repair - Tube repair menu

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	T	u	b	e		r	e	p	a	i	r									
2	>		1	.	S	e	l	e	c	t		p	r	e	s	e	t			
3			2	.	S	t	a	r	t											
4																				

1-2	Select item 1-2 respectively
↑	Move cursor up one line
↓	Move cursor down one line
ENT	Select currently current item
X	Leave current menu level and return to main menu
others	No function

3.3.1.1 Select preset menu

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	S	e	l	e	c	t		p	r	e	s	e	t							
2	>		1	.	P	r	e	s	e	t		1								
3			2	.	P	r	e	s	e	t		2								
4			3	.	P	r	e	s	e	t		3								

The screen continues to item “9.Preset 9”.

1-9	Select item 1-9 respectively and return to tube repair menu
↑	Move cursor up one line
↓	Move cursor down one line
→	Go to preset preview menu of the current currently under the cursor
ENT	Select preset currently under the cursor and return to tube repair menu
X	Leave current menu level and return to tube repair menu
others	No function

Note: The system will always assume preset1 selected when no other selection is done.

3.3.1.2 Preset preview screen

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	P	r	e	s	e	t		X		i	n	f	o							
2	S	t	a	r	t	:				1	2	3	m				1	2	3	m
3	T	i	m	e	:					1	2	3	m				1	2	3	m
4	V	o	l	t	:			1	2	3	4	5	m		1	2	3	4	5	m

Where ‘X’ is the number of the preset that has been selected for preview.

←	Go back select preset menu
X	Go back select preset menu
others	No function

3.3.1.3 Start repair menu

3.3.1.3.1 Error messages based on safety

Before starting the repair treatment, it will be verified that the cover of the drawer is closed correctly. For safety reason the cover must be closed before the repair treatment can be started.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1						!	!	E	R	R	O	R	!	!						
2					C	O	V	E	R		O	P	E	N						
3																				
4			H	i	t		X		t	o		c	o	n	t	i	n	u	e	

X	Acknowledge error and return to main menu
others	No function

Note: it is not sufficient to close the cover. The system will only react to the X key and return to the main menu. Closing the cover is, however, mandatory before starting a new repair.

3.3.1.3.2 Repair in progress

When all conditions are met, the repair treatment starts. The display now acts as feedback

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	X			h	h	:	m	m	:	s	s		t	o	t	a	l			
2				h	h	:	m	m	:	s	s		r	e	m	a	i	n		
3			R	1						R	2						R	3		
4	1	2	3	4	5	V		1	2	3	4	5	V		1	2	3	4	5	V

The number in row1/column1 represents the selected preset number.

X	Pause the current repair action
others	No function

3.3.1.4 Repair pause

3.3.1.4.1 Repair paused

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2						R	E	P	A	I	R		B	U	S	Y				
3			H	i	t			X			t	o		P	A	U	S	E		
4																				

When X is hit during an active repair, the screen above appears. This is to suppress accidental keyboard actions. If a pause is requested the user must press X a second time. This screen will remain on display for one second. If the X-button is not pressed within this time, the system will return to the “repair in progress” screen.

X	Pause the current repair action
others	No function

Pausing the repair process automatically turns down the voltage output of all rows to 0 volts. It can take some time to unload all capacities on the rows, so the system will keep waiting until all rows have a voltage below the safety threshold. The display will notify about this waiting time with the following screen

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2																				
3					W	A	I	T	I	N	G		F	O	R					
4						P	O	W	E	R		D	O	W	N					

When treatment is paused, the display will change its output to:

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2						!	!	P	A	U	S	E	!	!						
3		H	i	t		E	N	T		t	o		c	o	n	t	i	n	u	e
4		H	i	t			X			t	o		R	E	S	E	T			

ENT	Continue the current repair
X	Reset/quit the treatment and return to the tube repair menu
others	No function

3.4 Administrator Menu

3.4.1 Password protection

3.4.1.1 Password insertion screen

The operator menu is password protected. Prior to entering, the user must enter the password.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2																				
3						I	n	s	e	r	t		P	I	N					
4									-	-	-	-								

0-9	Insert number
←	Backspace – delete last entered digit
ENT	Confirm inserted PIN
X	Return to main menu
others	No function

3.4.1.2 Password accepted

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2																				
3								P	I	N		O	K							
4																				

others	No function

No action required. The screen will be left after three seconds and the operator menu will be entered.

3.4.1.3 Password denied

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2																				
3						P	I	N		D	E	N	I	E	D					
4																				

others	No function

No action required. The screen will be left after one second and the system will return to the main menu.

3.4.2 Operator main menu

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	A	d	m	i	n	i	s	t	r	a	t	i	o	n						
2	>		1	.	C	h	a	n	g	e		P	I	N						
3			2	.	I	/	O		c	o	n	t	r	o	l					
4			3	.	P	r	e	s	e	t		c	o	n	f	i	g			

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
			4	.	P	I	D		c	o	n	s	t	a	n	t	S			
			5	.	I	n	f	o		&		V	e	r	s	i	o	n		

1-5	Select item 1-5 respectively
↑	Move cursor up one line
↓	Move cursor down one line
ENT	Select currently current item
X	Leave current menu level and return to main menu
others	No function

3.4.2.1 Change PIN menu

3.4.2.1.1 Insert new Pin

/		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	h	a	n	g	e		P	I	N											
2																					
3					N	e	w		P	I	N	:				-	-	-	-		
4																					

X	Leave current menu level and return to administrator main menu without changing the PIN
←	Backspace – delete last entered digit
ENT	Confirm inserted PIN
0-9	Insert number
others	No function

When the 4-digit PIN has been entered, the screen automatically changes to:

/		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	h	a	n	g	e		P	I	N											
2																					
3					N	e	w		P	I	N	:				*	*	*	*		
4		R	e	p	e	a	t		P	I	N	:				-	-	-	-		

X	Leave current menu level and return to administrator main menu without changing the PIN
←	Backspace – delete last entered digit
ENT	Confirm inserted PIN
0-9	Insert number
others	No function

When the 4-digit has been entered a second time, the system will verify that both entered PINs are equal.

3.4.2.1.2 New Pin OK

/		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																					
2																					
3			N	e	w		P	I	N		a	c	c	e	p	t	e	d			
4																					

others	No function

No action required. The screen will be left after three seconds and the administrator main menu will appear again.

3.4.2.1.3 New Pin failed

/		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																					
2																					
3				N	e	w		P	I	N		d	e	n	i	e	d				
4																					

others	No function

No action required. The screen will be left after three seconds and the administrator main menu will appear again.

3.4.2.2 I/O control menu

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	I	/	0		c	o	n	t	r	o	l									
2	>		1	.	R	e	a	d		i	n	t	e	r	l	o	c	k		
3			2	.	S	o	l	e	n	o	i	d	S							
4			3	.	G	e	t		v	o	l	t	a	g	e		i	n		

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
			4	.	S	e	t		v	o	l	t	a	g	e		o	u	t	

1-4	Select item 1-4 respectively
↑	Move cursor up one line
↓	Move cursor down one line
ENT	Select currently current item
X	Leave current menu level and return to administrator I/O menu
others	No function

3.4.2.2.1 Read interlock

Reading the interlock status is a constant action, meaning that the screen will immediately update its content with the interlock status.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2		C	o	v	e	r		i	n	t	e	r	l	o	c	k		i	s	
3																				
4																				

If interlock is open:

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3									o	p	e	n								

If interlock is closed:

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3								c	l	o	s	e	d							

X	Leave current menu level and return to administrator I/O menu
others	No function

3.4.2.2.2 Solenoids

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	S	o	l	e	n	o	i	d	s											
2			H	o	l	d		0		t	o		t	o	g	g	l	e		
3																				
4																				

0	Press: activate solenoids (open cover) Release: de-activate solenoids (seal cover)
X	Leave current menu level and return to administrator I/O menu
others	No function

3.4.2.2.3 Get voltage in

The screen to read the voltage input is a read-only screen, meaning that no user action is accepted (other than leaving the menu).
The screen shows the currently read voltage on all three rows in both voltage (left value) and the corresponding hexadecimal value of the DA converter.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	G	e	t		v	o	l	t	a	g	e		i	n						
2	R	o	w	1	:		1	2	3	4	5	V	¦		A	B	C	D	x	
3	R	o	w	2	:		1	2	3	4	5	V	¦		A	B	C	D	x	
4	R	o	w	3	:		1	2	3	4	5	V	¦		A	B	C	D	x	

X	Leave screen and return to administrator I/O menu
others	No function

3.4.2.2.4 Set voltage out

The screen to set the voltage input is allows to apply a voltage to the three rows.
The cursor is put at the first row when entering the menu.
The screen shows two values per row. The left value is the value that the administrator inserts and applies to the DA converter of that specific row. The right value of that row is the actual value that is read back from the AD converter of that same row.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	G	e	t		v	o	l	t	a	g	e		i	n						
2	R	o	w	1	:		1	2	3	4	5	V	¦		1	2	3	4	5	V
3	R	o	w	2	:		1	2	3	4	5	V	¦		1	2	3	4	5	V
4	R	o	w	3	:		1	2	3	4	5	V	¦		1	2	3	4	5	V

0-9	Used for value insertion
↑	Move cursor up one row
↓	Move cursor down one row
←	Backspace – delete last entered digit
ENT	Accept inserted value and apply to DA converter of that row
X	Leave screen and return to administrator I/O menu
others	No function

Leaving the set voltage out menu causes the following screen to appear.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2																				
3	A	l	l		r	o	w	s		r	e	s	e	t		t	o		0	V
4		P	r	e	s	s		X		t	o		c	o	n	t	i	n	u	e

X	Leave screen and return to administrator I/O menu
others	No function

3.4.2.3 Preset config

Selects a preset to configure.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	P	r	e	s	e	t		c	o	n	f	i	g							
2			1	.	P	r	e	s	e	t		1		c	o	n	f	i	g	
3			2	.	P	r	e	s	e	t		2		c	o	n	f	i	g	
4			3	.	P	r	e	s	e	t		3		c	o	n	f	i	g	

The screen continues until item “9.Preset 9 config”.

1-9	Select item 1-9 respectively
↑	Move cursor up one row
↓	Move cursor down one row
ENT	Select current preset under the cursor
X	Leave screen and return to administrator menu
others	No function

The first six presets are only contain one stage, while preset seven, eight and nine contain two repair stages. The screen underneath represents a preset with two stages. For a single-stage preset, the second column with values is not available.
When entering this screen, the cursor is put to the start value of the first stage. The value can be updated/modified. Button ‘ENT’ accepts the value and sets the cursor to the next value. When the last value has been reached, ‘ENT’ will cause the system to save the modified preset to system memory and leave the preset configuration screen, returning to the preset selection overview.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	P	r	e	s	e	t		X		c	o	n	f	i	g					
2	S	t	a	r	t	:				1	2	3	m				1	2	3	m
3	T	i	m	e	:					1	2	3	m				1	2	3	m
4	V	o	l	t	:			1	2	3	4	5	V		1	2	3	4	5	V

Where ‘X’ is the number of the currently configurated preset.

0-9	Digit insertion
←	Backspace – delete last entered digit
ENT	Accept inserted value and continue. When last value is reached, ENT will save the modified preset and return to the preset selection overview.
X	Leave screen and return to preset config menu without saving
others	No function

When a preset is modified and saved, the system will confirm this action with an additional screen that appears only temporary.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2																				
3					P	r	e	s	e	t		s	a	v	e	d				
4																				

This screen will disappear after one second and the preset selection overview will be shown.

3.4.2.4 Information and version screen

The full screen on display, containing the system version number, will look like:

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	A	n	o	d	e		r	e	p	a	i	r								
2																				
3					S	W		V	.		1	.	0	.	0	.	0			
4																				

X	Leave screen and return to administrator menu
others	No function

3.5 Calibration menu

3.5.1 Password protection

3.5.1.1 Password insertion screen

The calibration menu is password protected. Prior to entering, the user must enter the password.

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1			C	a	l	i	b	r	a	t	i	o	n		m	e	n	u		
2																				
3						I	n	s	e	r	t		P	I	N					
4									-	-	-	-								

0-9	Insert number
←	Backspace – delete last entered digit
ENT	Confirm inserted PIN
X	Return to main menu
others	No function

3.5.1.2 Password accepted

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1			C	a	l	i	b	r	a	t	i	o	n		m	e	n	u		
2																				
3								P	I	N		O	K							
4																				

others	No function

No action required. The screen will be left after 3 seconds and the calibration main menu will be entered.

3.5.1.3 Password denied

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1			C	a	l	i	b	r	a	t	i	o	n		m	e	n	u		
2																				
3						P	I	N		D	E	N	I	E	D					
4																				

others	No function

No action required. The screen will be left after 3 seconds and the password insertion screen will appear again.

3.5.2 Calibration main menu

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	a	l	i	b	r	a	t	i	o	n		m	e	n	u				
2	>		1	.		C	a	l	i	b	r	a	t	e		A	D	C	s	
3																				
4																				

↑	Move cursor up one line (currently not implemented)
↓	Move cursor down one line (currently not implemented)
ENT	Select currently current item
X	Leave current menu level and return to main menu
others	No function

The only calibration option at the moment is the analogue-to-digital converter, or analogue input.

3.5.2.1 Calibrate ADCs menu

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	a	l	i	b	r	a	t	e		A	D	C	s						
2	>		1	.		C	h	a	n	n	e	l	1							
3			2	.		C	h	a	n	n	e	l	2							
4			3	.		C	h	a	n	n	e	l	3							

↑	Move cursor up one line
↓	Move cursor down one line
ENT	Select currently current item
X	Leave current menu level and return to main menu
others	No function

3.5.2.1.1 Calibration procedure for an ADC channel

The following menu is similar for all ADC channels

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	a	l	i	b	r	a	t	e		A	D	C		#	1				
2							P	r	o	v	i	d	e							
3										0		k	V							
4					a	n	d		h	i	t		E	N	T					

ENT	Confirm provided voltage and continue to next calibration point
X	Leave calibration procedure and return to calibrate ADCs menu
others	No function

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	a	l	i	b	r	a	t	e		A	D	C		#	1				
2							P	r	o	v	i	d	e							
3										1		k	V							
4					a	n	d		h	i	t		E	N	T					

ENT	Confirm provided voltage and continue to next calibration point
X	Leave calibration procedure and return to calibrate ADCs menu
others	No function

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	a	l	i	b	r	a	t	e		A	D	C		#	1				
2							P	r	o	v	i	d	e							
3									1	0		k	V							
4					a	n	d		h	i	t		E	N	T					

ENT	Confirm provided voltage and continue to next calibration point
X	Leave calibration procedure and return to calibrate ADCs menu
others	No function

/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	C	a	l	i	b	r	a	t	e		A	D	C		#	1				
2					C	a	l	i	b	r	a	t	i	o	n					
3							f	i	n	i	s	h	e	d						
4																				

ENT	Confirm and return to calibrate ADCs menu
others	No function

The exact calibration procedure is not defined, yet, so the menu definition, especially the calibration points mentioned, are subject to changes!