

Bosch Protocol Technical Information



en Application Note



1 Contents

1	Contents	2
2	Change History	2
	Introduction	3
3	Opcode Commands Supported	3
3.1	OSRD Opcodes.....	3
4	MIC 500 Opcode 7.....	3
4.1	Aux Controls.....	3
4.2	Preset Controls.....	4
5	MIC 400 Opcode 7.....	6
5.1	Aux Controls.....	6
5.2	Preset Controls.....	7
6	MIC 412 Opcode 7.....	9
6.1	Aux Controls.....	9
6.2	Preset Controls.....	10

2 Change History

Revision	Description of Change	Change Note	Author	Date
1.0	First Release	n/a	C. Vanstone	01/04/2009
1.1	Auxiliaries 37 to 42 added for MIC 400 Brushless software	n/a	C. Vanstone	26.11.09
2.0	- Update to Bosch format - Add in MIC 500 aux list and preset list - Add MIC model support for the Opcode list	n/a	C. Vanstone	05.03.10
2.1	Add in home time command	n/a	C. Vanstone	29.06.10
2.2	Removed Opcodes that are only supported by Camset	n/a	M. Brumbaugh	13 April 2011

Introduction

This document describes how the features of a MIC running Bosch protocol are accessed using Auxiliaries or presets from a given controller. There is also a section outlining the command types supported from the Bosch protocol.

Description: There are two possible interfaces, Biphase (using MIC-BP converters) and RS-485 over 2 wires.

Bosch Biphase is a single-directional communication link that utilizes BOSCH OSRD protocol.

Default RS-485 parameters:

9600 baud, no parity, 8 data bits, 1 stop bit

3 Opcode Commands Supported

The standard Bosch Opcodes which are supported by the MIC series of cameras are listed in the chart below. Please refer to the **AutoDome OSRD protocol guide** for further details on how to use these commands.

3.1 OSRD Opcodes

Opcode	Description	Command Type	MIC Model Support		
			MIC 400	MIC 412	MIC 500
2	PTZ control, fixed speed indefinite time	OSRD	✓	✓	
4	PTZ control, fixed speed, times out after approx 100ms so requires continual polling to produce smooth movement	OSRD	✓	✓	✓
5	PTZ control, variable speed, indefinite time	OSRD	✓	✓	✓
6	Lens control, fixed speeds, times out after approx 100ms so requires continual polling to produce smooth movement	OSRD	✓	✓	✓
7	Preset and auxiliary control	OSRD with Some unique AUX and Preset commands	✓	✓	✓
8	PTZ control, variable speed, times out after approx 100ms so requires continual polling to produce smooth movement	OSRD	✓	✓	✓

4 MIC 500 Opcode 7

4.1 Aux Controls

Aux	Function	Description (MIC function)	Notes
2	Auto Pan	On: Starts Auto Pan between Scan Limits, tilt can be adjusted Off: Stops Auto Pan	The AUX OFF command must be issued to regain manual control. The Left & Right Limits must be set using the OSD menu/Advanced Setup. Use MANUAL CONTROL and the appropriate LIMIT selections.
3	Iris Control	On: Iris Auto Off: Iris Manual	
4	Focus Control	On: Focus Auto Off: Focus Manual	
7	Plays Pre-position Tour 2	On: Starts Tour 2 Off: Stops Tour 2	
8	Play Pre-position Tour 1	On: Starts Tour 1 Off: Stops Tour 1	
9	Inactive Home Return	On: Activates the Inactivity timer for the Auto Home mode that is selected in the menus Off: Deactivates the Inactivity timer	Default is Auto Home OFF; Return to PRESET; Inactivity timer 5 minutes (300 seconds)
46	OSD Menu	Displays the OSD programming menu	
50	Play Pattern Tour 1	On: Play Pattern 1 Off: Stop Pattern	
52	Play Pattern Tour 2	On: Play Pattern 2 Off: Stop Pattern	

Aux	Function	Description (MIC function)	Notes
57	IR	On: IR Mode On Off: IR Mode Off	Also referred to as night mode. Auto IR must also be ENABLED (SET 196).
100	Record Pattern Tour 1	On: Record Pattern 1 Off: Stop Pattern	
101	Record Pattern Tour 2	On: Record Pattern 2 Off: Stop Pattern	
401	Wiper	On: Closes Wiper Relay Off: Open Wiper Relay	
402	Washer	On: Closes Washer Relay (Wipes if wash wipe is enabled) Off: Open Washer Relay	
417	Protocol Change Stage 1	Continue to stage 2	
418	Protocol Change Stage 2	Takes Next Aux as Protocol and Address Byte	
420	On Screen menu	Display On Screen Menu	
007	Fast Address	Displays the current Fast Address	
998	Enter Fast Address mode	Follow on screen instructions	

4.2 Preset Controls

Both Learn/Set and Go To/Shot Preset Functions	Preset No.
Preset Positions	1 – 64
Auto Home Position	1
Wash Wipe Position	62
Auto Alarm Position	63
Multi Alarm Positions (1 to 8)	50 – 57

Learn/Set Preset Function	Preset No.
Pan Reverse Enable	194
Pan Reverse Disable	195
Tilt Reverse Enable	190
Tilt Reverse Disable	191
Picture Flip On	188
Picture Flip Off	189
Auto Flip On (Mechanical Auto Pivot)	217
Auto Flip Off	218
NOTE: The cameras must be in the NORMAL viewing position when this is activated (Preset 217)	
E-Flip On (Electronic Auto Pivot)	180
E-Flip Off	181
Auto Home to Preset	204
Auto Home to Tour	205
Auto Home Off	206
Auto Home to Pattern	215
Wash Wipe Enable	219
Wash Wipe Disable	220
Intermittent Wipe On	198
Intermittent Wipe Off	199
Auto Alarm Enable	236
Auto Alarm Disable	237
Multi Alarms Enable	207
Multi Alarms Disable	208
Auto Lowlight Enable	238
Auto Lowlight Disable	239
Auto IR Enable	196
Auto IR Disable	197
NOTE: Must be enabled for AUX 57 to work.	
Photocell IR Enable	192
Photocell IR Disable	193

Learn/Set Preset Function	Preset No.
IR Illumination On	178
IR Illumination Off	179
Set Top Left Soft Stop	200
Set Bottom Right Soft Stop	201
Set Preset Tour No. to 1	211
Set Preset Tour No. to 2	212
Set Preset Tour No. to 3	213
Set Preset Tour No. to 4	214
NOTE: Only used when Auto Home is programmed for TOUR in the MIC SETUP menu and 4 different tours have been saved. These commands change which TOUR is activated at the end of the INACTIVITY TIME period.	
Recalibrate Camera Module	251
Load Factory Defaults	255
Find End Stops	98
Show Boot Message	99
Privacy	
Hide Crosshair	225
Show Crosshair (Must activate Set 232 first)	226
Clear single pixel at centre	227
Mark single pixel at centre	228
Change Mask Style (Must activate Set 231 first)	229
Hide Mask Style	230
Show Mask Style	231
All masks ON	232
All masks OFF	233
Clear Whole Screen	234
Mask Whole Screen	235

Go To Preset Function	Preset No.
On Screen menu	85
Self Diagnosis	86
Play Pattern One	87
Stop Pattern One	88
Record Pattern One	89
Play Pattern Two	90
Stop Pattern Two	91
Record Pattern Two	92

Execute Sony Set 1	240
Execute Sony Set 2	241
Execute Sony Set 3	242
Execute Sony Set 4	243
Execute Sony Set 5	244
Execute Sony Set 6	245
Execute Sony Set 7	246
Execute Sony Set 8	247
Execute Sony Set 9	248
Execute Sony Set 10	249

5 MIC 400 Opcode 7

5.1 Aux Controls

Aux	Function	Description (MIC function)
1	Focus Control	On: Enables Manual Focus Off: Disables Manual Focus => Auto Focus
2	Digital Zoom Enable	On: Digital Zoom is enabled Off: Digital Zoom is disabled
3	Iris Control	On: Enables Manual Iris Off: Disables Manual Iris => Auto Iris
4	Auto Lowlight	On: Enables Auto Lowlight, Decrease frame rate for low light conditions Off: Disables Auto Lowlight, Returns to Auto Iris
5	Wiper	On: Wiper On Off: Wiper Off
6	Washer	On: Washer On Off: Washer Off
7	Proportional PTZ	On: Enabled, Pan and Tilt Speed is scaled according to Zoom position Off: Disabled, Normal PTZ
8	IR Lamps	On: Switches IR Cut Filter & Lamps On Off: Switches IR Cut Filter & Lamps Off
9	Camera Power	On: Video Output from Sony Camera module is enabled Off: Video Output from Sony Camera module is disabled
10	Backlight	On: Backlight On Off: Backlight Off
11	B&W	On: Black & White Mode Off: Colour Mode
12	OSD	On: Shows Sony camera module On-Screen-Display Off: Hides Sony camera module On-Screen-Display
13	Shutter Speed (1/2 s)	On: Sets Shutter Speed to 1/2 s (fixed) Off: Returns to Auto Iris
14	Address Change Stage 1	On: Sets variable for Address Changing -> must call Aux 21 On, to continue Off: Clears variable for Address Changing
15	Pan Reverse	On: Pan direction is reversed Off: Pan direction is normal
16	Auto Alarm	On: Enables Auto Alarm Off: Disables Auto Alarm
17	Preset Tour	On: Starts a Preset Tour Off: Sets up a Preset Tour, 1 to 5, 5 sec dwell
18	Preset Tour	On: Sets up a Preset Tour, 1 to 5, 15 sec dwell Off: Sets up a Preset Tour, 1 to 5, 60 sec dwell
19	Preset Tour	On: Sets up a Preset Tour, 1 to 10, 5 sec dwell Off: Sets up a Preset Tour, 1 to 10, 5 sec dwell
20	Preset Tour	On: Sets up a Preset Tour, 1 to 10, 60 sec dwell Off: Same as On.
21	Address Change Stage 2&3	On: Sets variable for Address Changing -> must call Aux 21 Off, to continue Off: Sets variable for Address Changing -> next Aux {A} Off, {A} is new address.
22	Auto Home	On: Auto home enabled, will return to home position after idle for 300 seconds. Off: Auto home disabled
23	White Balance	On: Auto White balance Off: Outdoor White balance
24	Auto IR	On: Enables Auto IR, camera module switches to IR mode automatically Off: Disables Auto IR
25	Washwipe	On: Enables Washwipe, camera moves to Washwipe position on Washer On Aux Off: Disables Washwipe
26	Multialarms	On: Multialarms On, required for multi-alarm card and IR lamp control Off: Multialarms Off
27	Home to	On: Camera Auto Homes to Home Preset Off: Camera Auto Homes to Preset Tour
28	Shutter Speed (1/300s)	On: Sets Shutter Speed 1/300s (fixed) Off: Returns to Auto Iris
29	Shutter Speed (1/600s)	On: Sets Shutter Speed 1/600s (fixed) Off: Returns to Auto Iris
30	Shutter Speed (1/1000s)	On: Set Shutter Speed 1/1000s (fixed) Off: Returns to Auto Iris
31	Image Flip	On: Inverts Video Image Off: Normal Video Image
32	Tilt Reverse	On: Tilt direction is reversed Off: Tilt direction is normal

Aux	Function	Description (MIC function)
36	Photocell IR	On: Photocell can be used to switch to IR mode, mapped to Multialarm Input 4 Off: Photocell IR mode disabled
37	Auto Pan with Limits	On: Starts MIC panning at a fixed speed between 2 limits (Preset 116 & 117) Off: Stops MIC panning NOTE: The AUX OFF command must be issued to regain manual control. The Tilt angle maybe changed during panning, but Pan control is not possible.
38	Auto Pan Speed	On: Increase the Auto Pan speed by 5 units in the range 1 to 255 Off: Decrease the Auto Pan speed by 5 units in the range 1 to 255
39	Auto Pan without Limits	On: Starts MIC panning at a fixed speed with no limits Off: Stops MIC panning NOTE: The AUX OFF command must be issued to regain manual control. The Tilt angle maybe changed during panning, but Pan control is not possible.
40	Auto Home	On: Auto Home to Auto Pan with limits Off: Auto Home to Auto Pan without Limits
41	Preset Tour	On: Start preset tour Off: Stop preset tour
42	IR Illumination	On: Sets the back focus of the camera lens for IR light Off: Sets the back focus of the camera lens for visible light

5.2 Preset Controls

General Presets

Preset #	Learn/Set Function	Go To Function
1 – 34	Learns Preset Position	Go to Preset Position
35	Set Multi Alarm 1	Show Multi Alarm 1
36	Set Multi Alarm 2	Show Multi Alarm 2
37	Set Multi Alarm 3	Show Multi Alarm 3
38	Set Multi Alarm 4	Show Multi Alarm 4
39	Set Multi Alarm 5	Show Multi Alarm 5
40	Set Multi Alarm 6	Show Multi Alarm 6
41	Set Multi Alarm 7	Show Multi Alarm 7
42	Set Multi Alarm 8	Show Multi Alarm 8
47	Set Wash Wipe Position	Show Wash Wipe Position
48	Set Home Position	Show Home Position
49	Set Auto Alarm Position	Show Auto Alarm Position
50	N/A	Aux 1 On
51	N/A	Aux 1 Off
52	N/A	Aux 2 On
53	N/A	Aux 2 Off
54	N/A	Aux 3 On
55	N/A	Aux 3 Off
56	N/A	Aux 4 On
57	N/A	Aux 4 Off
58	N/A	Aux 5 On
59	N/A	Aux 5 Off
60	N/A	Aux 6 On
61	N/A	Aux 6 Off
62	N/A	Aux 7 On
63	N/A	Aux 7 Off
64	N/A	Aux 8 On
65	N/A	Aux 8 Off
66	N/A	Aux 9 On
67	N/A	Aux 9 Off
68	N/A	Aux 10 On
69	N/A	Aux 10 Off
70	N/A	Aux 11 On
71	N/A	Aux 11 Off
72	N/A	Aux 12 On
73	N/A	Aux 12 Off
74	N/A	Aux 13 On
75	N/A	Aux 13 Off
76	N/A	Aux 14 On
77	N/A	Aux 14 Off
78	N/A	Aux 15 On
79	N/A	Aux 15 Off
80	N/A	Aux 16 On

Preset #	Learn/Set Function	Go To Function
81	N/A	Aux 16 Off
82	N/A	Aux 17 On
83	N/A	Aux 17 Off
84	N/A	Aux 18 On
85	N/A	Aux 18 Off
86	N/A	Aux 19 On
87	N/A	Aux 19 Off
88	N/A	Aux 20 On
89	N/A	Aux 20 Off
90	N/A	Aux 21 On
91	N/A	Aux 21 Off
92	N/A	Aux 22 On
93	N/A	Aux 22 Off
94	N/A	Aux 23 On
95	Set soft stop top left corner	Aux 23 Off
96	Set soft stop bottom right corner	Aux 24 On
97	N/A	Aux 24 Off
115	Find end stops	N/A
116	Set left pan limit	Show left pan limit
117	Set right pan limit	Show right pan limit

Privacy Functions (only applicable for privacy models)

Preset #	Learn/Set Function
103	Hide Crosshair
104	Show Crosshair (Must activate Set 110 first)
105	Clear single pixel at centre
106	Set single privacy pixel at centre
107	Set privacy mask style (Must activate Set 109 first)
108	Hide privacy mask style
109	Show privacy mask style
110	All masks ON
111	All masks OFF
112	Clear whole screen
113	Mask whole screen

6 MIC 412 Opcode 7

6.1 Aux Controls

Aux	Function	Description (MIC function)
1	Scan	On: Starts Scanning, CCW, tilt can be adjusted Off: Stops Scanning
2	Auto Pan	On: Starts Auto Pan between Scan Limits, tilt can be adjusted Off: Stops Auto Pan
3	Iris Control	On: Iris Auto Off: Iris Manual
4	Focus Control	On: Focus Auto Off: Focus Manual
7	Plays Pre-position Tour 2	On: Starts Tour 2 Off: Stops Tour 2
8	Play Pre-position Tour 1	On: Starts Tour 1 Off: Stops Tour 1
9	Inactive Home Return	On: Toggles between Return Home (Preset 99) or Return Pre-position Tour (Inactivity after 300 seconds) Off: Inactive Home Return OFF
14	Set Auto Pan Speed	Increment: Increases Auto-Pan & Scan speed Decrement: Decreases Auto-Pan & Scan speed Range: 1-255 Granularity: 1
20	Backlight Compensation	On: Enable Off: Disable
23	Shutter Adjust	On: Increases Shutter POS Off: Decreases Shutter POS
24	Auto Shutter	On: Auto Exposure Mode (Clears auto lowlight) Off: Shutter Priority Exposure Mode (Clears auto lowlight)
35	White Balance	On: Auto White Balance Off: Outdoor White Balance
41	Line Lock Phase Adjust	On: Vertical Phase Up Off: Vertical Phase Down
42	Sync Mode	On: Sync Mode Line Off: Sync Mode Crystal
44	Aperture Correction (Sharpness)	On: Increase Sharpness Off: Decrease Sharpness
57	Thermal	On: Thermal Off: Optical
60	On Screen Display	On: Turns OSD in Sony module on Off: Turns OSD off
66	Displays Software Version	On: Displays Software Version for 10 seconds
80	Digital Zoom Lock	On: Allows Digital Zoom Off: Disallows Digital Zoom
246	FAST_ADDRESS STAGE 1	On: Continuous to Stage 2 in Fast address reprogram Off: Cancels fast address reprogram
292	FAST_ADDRESS STAGE 2	On: Continuous to Stage 3, which requires controller to move to new address and "PRESS ON 1 ENTER" Off: Cancels fast address reprogram
401	Wiper	On: Closes Wiper Relay Off: Open Wiper Relay
402	Washer	On: Closes Washer Relay (Wipes if washwipe is enabled) Off: Open Washer Relay
403	Wash Wipe	On: Enable Off: Disable
404	Scaled PTZ	On: Enable Off: Disable
405	Thermal	On: Thermal Off: Optical
408	B&W	On: B&W On Off: B&W Off
409	Pan Reverse	On: Enable Off: Disable
410	Tilt Reverse	On: Enable Off: Disable
411	Image Flip	On: Enable Off: Disable
418	Program Preset Tours	On: Presets 1 to 5, dwell of 5 secs

Aux	Function	Description (MIC function)
		Off: Presets 1 to 5, dwell of 15 secs
419	Program Preset Tours	On: Presets 1 to 10, dwell of 5 secs Off: Presets 1 to 10, dwell of 15 secs
451	Thermal Orientation	On: Thermal Inverted Off: Thermal normal
		NOTE: The thermal camera module is installed upside down in the camera, so these settings appear to be reversed.
452	Thermal FFC Mode	On: Auto FFC Mode Off: Manual FFC Mode
453	Thermal FFC Control	On: Perform FFC Off: N/A
454	Thermal Colour	On: Thermal Colour White Hot Off: Thermal Colour Black Hot
455	Thermal Colour	On: Thermal Colour Ice Fire Off: Thermal Colour Glowbow
456	Thermal Colour / Gain Mode	On: Thermal Colour Ironbow Off: Thermal Gain Mode Histogram
457	Thermal Gain Mode	On: Thermal Gain Mode Linear Off: Thermal Gain Mode Once Bright
911	Restart	On: Forces Watchdog to expire resetting camera
997	Fast Address Display	On: Displays camera address

6.2 Preset Controls

Preset	Learn Function	Go To Function
1 – 34	Learns Preset Position	Go to Preset Position
35	Set Multi Alarm 1	Show Multi Alarm 1
36	Set Multi Alarm 2	Show Multi Alarm 2
37	Set Multi Alarm 3	Show Multi Alarm 3
38	Set Multi Alarm 4	Show Multi Alarm 4
39	Set Multi Alarm 5	Show Multi Alarm 5
40	Set Multi Alarm 6	Show Multi Alarm 6
41	Set Multi Alarm 7	Show Multi Alarm 7
42	Set Multi Alarm 8	Show Multi Alarm 8
47	Set Wash Wipe Position	Show Wash Wipe Position
48	Set Home Position	Show Home Position
49	Set Auto Alarm Position	Show Auto Alarm Position
50	N/A	Aux 1 On
51	N/A	Aux 1 Off
52	N/A	Aux 2 On
53	N/A	Aux 2 Off
54	N/A	Aux 3 On
55	N/A	Aux 3 Off
56	N/A	Aux 4 On
57	N/A	Aux 4 Off
62	N/A	Aux 7 On
63	N/A	Aux 7 Off
64	N/A	Aux 8 On
65	N/A	Aux 8 Off
66	N/A	Aux 9 On
67	N/A	Aux 9 Off
68	N/A	Aux 10 On
76	N/A	Aux 14 On
77	N/A	Aux 14 Off
88	N/A	Aux 20 On
89	N/A	Aux 20 Off
94	N/A	Aux 23 On
95	N/A	Aux 23 Off
96	N/A	Aux 24 On
97	N/A	Aux 24 Off
101	Set left pan limit	N/A
102	Set right pan limit	N/A
115	Find end stops	N/A