

# GOLDSTAR GSX408/816

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## INTRODUCTION

The GSX-408/816 Key Telephone System is designed to meet the telecommunications needs of small to medium sized businesses.

The Key Service Unit (KSU) is a wall mountable unit that contains Key Service Board, Power Supply, Battery Backup Unit, Real Time Clock Unit and pre-wired connectors for station and CO line interfaces.

The GSX-408/816 is a flat pack system equipped with 4 CO lines and 8 Stations. It can be easily expanded to 8 CO lines and 16 stations with a modular PCB mounted in the KSU.

Crane Telecommunications are the sole importer of these systems into the UK. Goldstar UK have nothing to do with them what so ever. Installation manuals are scarce due the fact Crane Telecommunications operated maintenance contracts on the systems and were reluctant to let the owners carry out their own re-programming. If the system is second-hand you will have trouble getting any support for it at all.

Y2K Compliant.

## TECHNOLOGY

The GSX-408/816 Key Telephone system is a microprocessor controlled, solid state electronic switching system which distributes communications in a non-blocking format. All control, switching interface circuitry is condensed onto a single printed circuit board (PCB) located inside the key service unit.

Switching is accomplished through a solid state crosspoint matrix that provides voice path connections for 4 (8) central offices lines, 8 (16) key telephones and 8 intercom paths.

The CO interfaces are equipped with transformer barriers for system classification as an FCC fully protected system. Each CO circuit supports rotary or DTMF dialing under software control. The DTMF tones and system supervisory tones are generated in each keyset.

The central microprocessor is a Z-80 and controls the crosspoints and central office relays. It also controls communications between slave microprocessor located in each GSX key telephone.

The 408/816 contains all system memory, which is composed of 96K of Read Only Memory (ROM) and 16K of Random Access Memory (RAM). The RAM is sub-divided so that part is used for customer database. A long life lithium battery protects the customer database memory. The system general memory (ROM) is contained in a Program Module (PM) that is interfaced to the KSU through a modular connecting arrangement. This allows easy access for removal of system software when upgrading software feature packages.

Each key telephone contains a microprocessor and circuitry to monitor button activity and control lamp conditions. A built-in speaker permits voice or tone calling to the station. Every telephone has a flexible button field, which can be individually programmed for 1 to 6 functions.

The key telephone sets are equipped with 9 fixed function buttons and either 12 or 24 flexible buttons which can be programmed by individual users, 2 volume controls an intercom mode selection switch and integrated speaker.

For emergency applications, a stand-alone battery assembly may be connected to the battery-input terminals on the KSU. This retains system power in the event of commercial power failure.

## SYSTEM CAPACITY

8	CO (Outside) Lines
8	Intercom Channels
16	Key Telephone Stations
1	External Music Source Input
1	External Paging port
2	Loud Bell Controls
1	Alarm Input (NOT BURGLAR ALARMS!)
1	24V DC Battery Connector
<b>OPTIONAL</b>	
1	RS232C Port for SMDR

## EQUIPMENT DESCRIPTION

### KEY SERVICE UNIT

The KSU is a self-contained unit that contains the power supply, processor, external connectors and circuits for 4 CO lines and 8 stations. External connections use 50way Telco connectors. A plug in module provides system-operating data in standard and advanced feature package. The system is provided with a real time clock to provide executive telephones with LCD, to have time and date displayed, and a battery to keep clock accurate in case of commercial power failure. This unit also provides SMDR to track date and time.

### KEY TELEPHONE

The 4-button telephone comes with 4 fixed feature buttons. 1 volume control and message waiting lamp.

The 8 button has the same size wit 4-button telephone but comes with 2 fixed feature buttons, 6 programmable buttons, 1 volume control and message waiting lamp.

The 21-button telephone comes in 2 models, Enhanced and Executive. Both models come with 9 fixed feature buttons, 12 programmable buttons, speakerphone, 2 volume controls, and intercom mode selection switch. In addition, the Executive model comes with a 2-line, 48-character LCD display.

The 33 button is similar to the 21-button but comes with 24 programmable buttons. Is also available in enhanced and executive style.





**4 Button Key Telephone**



**21 Button Key Telephone**

### PHONE BOX

The unit is basically a wall-mounted unit that is used for door-opening facilities. The system can handle a maximum of 8 of these units.

### SINGLE LINE ADAPTOR

This unit (shown pictured to the right) is for converting connection that would be intended for a key telephone and convert the signals so that a normal POTS telephone can attached to the system i.e. modem, answer phone etc. etc.



## DIMENSIONS AND WEIGHT

### KEY SERVICE UNIT

Height 419mm  
Width 298mm  
Depth 76mm  
Weight 8KG

### KEY TELEPHONE

Height 222mm  
Width 222mm  
Depth 70mm  
Weight 1.5KG

### PHONE BOX

Height 44mm  
Width 140mm  
Depth 102mm  
Weight 0.5KG

### EXPANSION MODULE

Height 279mm  
Width 140mm  
Depth 25mm

Weight 0.8KG

## NUMBERING PLAN

100-115		Station Numbers
250-255		Call Park locations
260-267		Hunt Group Pilot Numbers
281	(ATND)	WAKEUP Registration-effective until cancel
282	(ATND)	WAKEUP Registration-one time only
283	(ATND)	WAKEUP Cancel
284	(ATND)	PASSWORD Erase
285	(ATND)	LCD Format-ddmmyy/mmddy (toggle)
286	(ATND)	LCD Format-am-pm/24 hour (toggle)
299	(ATND)	Clock
3		Camp On (Call Wait)

## WIRING CONNECTION

### CO LINES

The CO Lines are connected to the RHS of the KSU on a 50 Way Telco connector.

PAIR	CO Line	COLOURS
1	1	BLUE / WHITE
2	2	ORANGE/WHITE
3	3	GREEN/WHITE
4	4	BROWN/WHITE
5	5	GREY/WHITE
6	6	BLUE/RED
7	7	ORANGE/RED
8	8	GREEN/RED
PAIR	CO POWER FAIL	COLOURS
21	1	BLUE/PURPLE
22	2	ORANGE/PURPLE
23	3	GREEN/PURPLE
24	4	ORANGE/PURPLE

Pairs 21-24 provide CO lines 1-4 back out of the system if there is a power failure. They will not show current if the system is powered up.

### STATION WIRING

Normally when the systems are installed for the first time, the supplier will have connected the pairs to KRONE IDC strips. Extension 100 will be on the first 2 pairs of the loom (Blue/White and Orange/White). The rest of the extensions will follow on until Extension 107, for extension 108 to 115 the loom cable will be the same as before but just plug it into the connector on the KSU for that extension range. For the wiring of cables to a PSTN socket for extension 100, it is like so: -

WHITE/BLUE	-	PSTN OUTLET PIN #4
BLUE/WHITE	-	PSTN OUTLET PIN #3
WHITE/ORANGE	-	PSTN OUTLET PIN #5
ORANGE/WHITE	-	PSTN OUTLET PIN #2

You will need to have a lot creative license to finally get all the rest of the stations wired up but it is fairly easy if you follow the standard that is used for extension 100.

Do not use PSTN Master sockets as they make the KSU/KEY Phone appear to be faulty when it isn't only use secondary sockets.

If you wire the socket up incorrectly you may get no response or possibly a full LCD screen test combined with interference sounds emitted from the speaker, then all goes dead on the handset

### **MUSIC ON HOLD / EXTERNAL PAGING**

The connections on the side of the KSU for these inputs and outputs are fairly well UN-DOCUMENTED! On the wiring loom for the extensions, pair 17 (ORANGE/YELLOW) are for connection of a of music device e.g. CD-Player, Radio etc. etc. Pair 18 is for connection to an external P.A system.

## **PROGRAMMING**

To enter program mode dial \*7764 from station 100. When programming it advisable to use an executive 21//33 key telephone. Programming can be achieved by using an enhanced but the LCD gives on-screen guidance.

To enter the programming menus press the recall button followed by the 2-digit program code.

Some menus appear twice but when they are entered into, they actually adjust different parameters even though they look the same.

## **PROGRAMMING CODES**

This section provides all the programming codes for the system. Some codes have sub menus so be thorough.

Key	Use	Key	Use
1	System Hold Re-Call	21	
2	Exclusive Hold Re-Call	22	Pulse Dialing Parameters
3	Transfer Re-Call	23	
4	Preset Forward Timer	24	

5	Pause Timer	25	ICM Box Timer ( Door Phone)
6	Call Park Timer	26	
7		27	Background Music Channel
8	Message Waiting Tone Timer	28	Date & Time
9	Paging Time Out	29	Monitor Mode
10	CO Ring Detect	30	CO Line Attributes
11	Hold Preference	31	
12		32	
13	Ext Night Ring	33	Attendant Re-Call
14		34	
15	Attendant Station Assignment	35	
16	Loud Bell Assignment	36	
17	PBX Dial Codes	37	
18	Executive Secretary Pairings	38	
19	Hunt Groups	39	Multi Line Conferencing
20	SMDR Parameters	40	Station Attributes

Key	Use	Key	Use
41		61	Initialize CO Lines
42		62	Initialize Stations
43		63	Initialize Exclusion Tables
44		64	Initialize System Speed Numbers
45		65	
46		66	
47		67	
48	SMDR Timer	68	
49	SMDR Long Distance Codes	69	
50	Exception Tables	70	Print System Data
51	<b>New Tel. No Plan</b>	71	Print System Parameters
52	Station Attributes	72	Print CO Lines
53		73	Print Stations
54		74	Print EX Tables
55		75	Print System Speed No
56	CO Delay Timer	76	Print Least Cost Routing
57		77	Print New STD Tables
58		78	
59		79	
60	Initialize System Parameters	80	

Key	Use
81	Least Cost Routing Enable
82	Inhibit BT Access
83	LCR Access Codes
84	LCR Authorization Codes
85	LCR Dial Tone Detect Timer
86	LCR Lookup Table
87	New Mercury STD Table
88	MCL Extension Billing
89	Disable 30 Sec
90	
91	Paging Timeout
92	
93	Monitor Mode

94	
95	SMDR Long distance Codes
96	
97	
98	
99	Disable 30 Sec
100	

## Wiring Diagram showing all connector uses published to date

**Extension 100  
-107 Loom**

Pair	Colour	PIN	Use
1	White/Blue	4	Ext
1	Blue/White	3	
2	White/Orange	5	100
2	Orange/White	2	
3	White/Green	4	Ext
3	Green/White	3	
4	White/Brown	5	101
4	Brown/White	2	
5	White/Grey	4	Ext
5	Grey/White	3	
6	Red/Blue	5	102
6	Blue/Red	2	
7	Red/Orange	4	Ext
7	Orange/Red	3	
8	Red/Green	5	103
8	Green/Red	2	
9	Red/Brown	4	Ext
9	Brown/Red	3	
10	Red/Grey	5	104
10	Grey/Red	2	
11	Black/Blue	4	Ext
11	Blue/Black	3	
12	Black/Orange	5	105
12	Orange/Black	2	
13	Black/Green	4	Ext
13	Green/Black	3	
14	Black/Brown	5	106
14	Brown/Black	2	
15	Black/Grey	4	Ext
15	Grey/Black	3	
16	Yellow/Blue	5	107
16	Blue/Yellow	2	
17	Yellow/Orange		Music
17	Orange/Yellow		On-Hold
18	Yellow/Green		External
18	Green/Yellow		Paging
19	Yellow/Brown		N/A
19	Brown/Yellow		N/A
20	Yellow/Grey		N/A
20	Grey/Yellow		N/A
21	Purple/Blue		N/A

**Extension 108  
-115 Loom**

Pair	Colour	PIN	Use
1	White/Blue	4	Ext
1	Blue/White	3	
2	White/Orange	5	108
2	Orange/White	2	
3	White/Green	4	Ext
3	Green/White	3	
4	White/Brown	5	109
4	Brown/White	2	
5	White/Grey	4	Ext
5	Grey/White	3	
6	Red/Blue	5	110
6	Blue/Red	2	
7	Red/Orange	4	Ext
7	Orange/Red	3	
8	Red/Green	5	111
8	Green/Red	2	
9	Red/Brown	4	Ext
9	Brown/Red	3	
10	Red/Grey	5	112
10	Grey/Red	2	
11	Black/Blue	4	Ext
11	Blue/Black	3	
12	Black/Orange	5	113
12	Orange/Black	2	
13	Black/Green	4	Ext
13	Green/Black	3	
14	Black/Brown	5	114
14	Brown/Black	2	
15	Black/Grey	4	Ext
15	Grey/Black	3	
16	Yellow/Blue	5	115
16	Blue/Yellow	2	
17	Yellow/Orange		N/A
17	Orange/Yellow		N/A
18	Yellow/Green		N/A
18	Green/Yellow		N/A
19	Yellow/Brown		N/A
19	Brown/Yellow		N/A
20	Yellow/Grey		N/A
20	Grey/Yellow		N/A
21	Purple/Blue		N/A

**CO Line Loom**

Pair	Colour	Use
1	White/Blue	CO 1
1	Blue/White	
2	White/Orange	CO 2
2	Orange/White	
3	White/Green	CO 3
3	Green/White	
4	White/Brown	CO 4
4	Brown/White	
5	White/Grey	CO 5
5	Grey/White	
6	Red/Blue	
6	Blue/Red	CO 6
7	Red/Orange	
7	Orange/Red	
8	Red/Green	CO 7
8	Green/Red	
9	Red/Brown	CO 8
9	Brown/Red	
10	Red/Grey	N/A
10	Grey/Red	N/A
11	Black/Blue	N/A
11	Blue/Black	N/A
12	Black/Orange	N/A
12	Orange/Black	N/A
13	Black/Green	N/A
13	Green/Black	N/A
14	Black/Brown	N/A
14	Brown/Black	N/A
15	Black/Grey	N/A
15	Grey/Black	N/A
16	Yellow/Blue	N/A
16	Blue/Yellow	N/A
17	Yellow/Orange	N/A
17	Orange/Yellow	N/A
18	Yellow/Green	N/A
18	Green/Yellow	N/A
19	Yellow/Brown	N/A
19	Brown/Yellow	N/A
20	Yellow/Grey	N/A
20	Grey/Yellow	N/A
21	Purple/Blue	CO 1

21	Blue/Purple		N/A	21	Blue/Purple		N/A	21	Blue/Purple	Power Fail
22	Purple/Orange		N/A	22	Purple/Orange		N/A	22	Purple/Orange	CO 2
22	Orange/Purple		N/A	22	Orange/Purple		N/A	22	Orange/Purple	Power Fail
23	Purple/Green		N/A	23	Purple/Green		N/A	23	Purple/Green	CO 3
23	Green/Purple		N/A	23	Green/Purple		N/A	23	Green/Purple	Power Fail
24	Purple/Brown		N/A	24	Purple/Brown		N/A	24	Purple/Brown	CO 4
24	Brown/Purple		N/A	24	Brown/Purple		N/A	24	Brown/Purple	Power Fail
25	Purple/Grey		N/A	25	Purple/Grey		N/A	25	Purple/Grey	N/A
25	Grey/Purple		N/A	25	Grey/Purple		N/A	25	Grey/Purple	N/A

### Installation of extra lines

When configuring extra lines, the system has to be told that extra lines exist ( program code 30). Then the function buttons on the keyphones need to be reassigned (program code 40, second command page).

Thanks to Nick Davies for this page

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