

UNITY MUX 5010

PRODUCT DESCRIPTION

USER'S MANUAL



WEGENER

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The **Wegener Product Name** is approved under **FCC Part 15B Class A, UL1950, CSA**, and **CE**. [Elaborate by including specific subsections of appropriate codes, if applicable.]



TABLE OF CONTENTS

CHAPTER 1 GENERAL INFORMATION

1.1 Manual Overview	1
1.2 UMX5010 Overview	2
Functional Description	2
Physical Description	2
1.3 UMX5010 Specifications	3
1.4 Safety Summary	5
1.5 Glossary of Terms and Abbreviations	5

CHAPTER 2 INSTALLATION

2.1 Unpacking and Inspection	7
2.2 Location and Mounting	7
FCC-mandated suppression of radiated emissions	7
Rack Mounting	9
Desktop Installation	9
2.3 UMX5010 Connections	10

CHAPTER 3 OPERATION

3.1 Operation Overview	13
3.2 Controls and Indicators	13
Liquid-crystal Display(LCD)	13
Pushbuttons	14
Front-panel LEDs	17
Rear-panel LEDs	19
3.3 Serial Ports	19
Device assignments	19
Device configurations	20
Device handling	20
3.4 Alarm/Warning System	22
Alarm Conditions	22
Warning Conditions	22
Maskable Alarm and Warning Conditions	23
3.5 Menu Screens	24
Default LCD Screens	27
Home Screen	27
Software Download Screen	28
Warning/Alarm Screen	29
EMAIL	30
CA Override	31
Transport Input Setup	31
Injected Stream Setup	32
COMPEL Input	32
CA Input	32
AUX Data Input	33
Conditional Access Setup	33

- CA Type 34
- Partition Scrambling 34
- CA scrambler partition PID 34
- Encryption Control Table. 34
- Fixed Key Encryption 35
- PIN Scrambling Key 35
- Carrier ID Tags Setup 35
- Serial Inputs Setups. 36
 - Aux/Term Port Device Selection 36
 - Unit ID, for Daisy-chain shared serial bus 37
 - Serial Device Setups. 38
 - Serial Device Settings. 38
- Miscellaneous Setups 38
 - Unit Front-panel Label. 39
 - Indicator Response Times. 39
 - User (solid-state) Contact Closures. 40
 - Application Software Switch 40
 - Reset Unit 41
- Unit Status 41
 - ASI Transport 41
 - COMPEL Stream. 42
 - CA Stream. 42
 - Aux Data Stream. 43
 - Serial Data Injection Buffer 43
 - Transport Stream Status 44
 - Time since log cleared 44
 - Clear Logs 44
- Network Control Status 45
- Current Version Information. 46
- Navigation Help 48
- 3.6 Terminal/Modem Mode. 50
 - Daisy chain terminal communication 50
 - Overview and syntax 50
 - User Commands 50
 - Local control commands 53
 - Report screens. 55
 - Scrambler and conditional access status 63
 - Diagnostic data 63
 - Indicator Timeout settings 64
 - Network Control Status 64
 - Solid state contacts 64
 - Serial data input settings. 65
 - Serial Port Configuration 65
 - Tag Site Table 65

CHAPTER 4 MAINTENANCE AND TROUBLESHOOTING

- 4.1 Maintenance. 67
- 4.2 Troubleshooting 67
 - No functions at all 67
 - No output 67

LED Indicators 68

CHAPTER 5 CUSTOMER SERVICE

 5.1 Warranty..... 71

 5.2 Technical Support 71

INDEX

LIST OF FIGURES

Figure 2.1: UMX 5010 Rear-Panel Connector Locations 7

Figure 3.1: Rear-Panel Connectors 9

Figure 3.2: UMX 5010 Front Panel Pushbuttons 10

Figure 3.3: UMX 5010 Front Panel LED indicators 12

LIST OF TABLES

Table 1.1: UMX 5010 Technical Specifications 2

Table 2.1: Rear-Panel Connectors 7

Table 3.1: UMX 5010 LCD Modes 9

Table 3.2: UMX 5010 LCD Types 10

Table 3.3: UMX 5010 Front Panel Pushbutton Description..... 11

Table 3.4: UMX 5010 Front Panel LED Indicator Descriptions..... 12

Table 3.5: UMX 5010 Rear Panel LED Indicator Descriptions 13

Table 3.6: UMX 5010 Serial Port Device Configurations 14

Table 3.7: UMX 5010 LCD Menu Screens 17

Table 3.8: UMX5010 Network-Enabled Local Control Commands..... 39

Table 3.9: UMX 5010 Local Terminal Commands..... 41

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CHAPTER 1 GENERAL INFORMATION

1.1 Manual Overview

This manual provides instructions and reference information for the proper installation and operation of the **Wegener Model UMX 5010 UnityMux**, referred to throughout the manual as the **UMX 5010**.

The manual is divided into the following chapters:

- 1 **General Information** - a description of your **UMX 5010**, its functions and specifications, and a glossary of terms.
- 2 **Installation** - procedures and information for the correct and safe installation of your .
- 3 **Operation** - instructions on starting and operating your **UMX 5010**.
- 4 **Maintenance and Troubleshooting** - information on maintaining your **UMX 5010** and resolving possible operating difficulties.
- 5 **Customer Service** - Our warranty and information on obtaining help.

An **Index** of keywords is also provided to help you quickly locate needed information.

Please e-mail any suggestions or comments concerning this manual to manuals@wegener.com. If you prefer to post them through the mail, please send your comments to the address below. If you have substantial or complex changes to recommend, our preference is that you copy the page(s) in question, mark your changes on that copy, and fax or mail us the copy. We always appreciate constructive criticism.

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1.2 UMX 5010 Overview

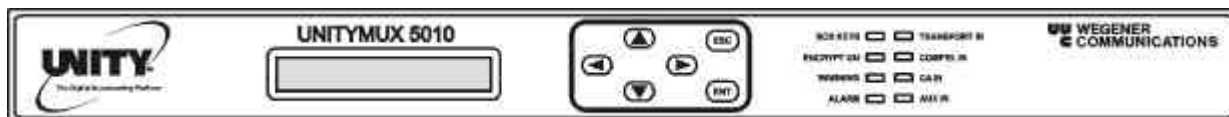
Functional Description

The Model UMX 5010 allows the injection of COMPEL network control and/or COMPEL/CA Conditional Access data into an input ASI-DVB transport stream and provides ASI output over two identical, isolated ports. The UMX 5010 supports MPEG transport streams per ISO 13818-1 at rates from 2.5 to 100 Mbps. Alarm and warning relays are provided in addition to two, solid-state, user control contacts. A single, auxiliary data channel through a rear-panel serial port may also be injected to the transport stream. The UMX 5010 may be upgraded for networking applications using the Ethernet port and can download new application software through the terminal port or (with upgrade) from COMPEL.

Physical Description

The UMX 5010 is housed in a standard, 1 RU, rack-mountable chassis. Its front panel (Figure 1.1: UMX 5010 Front Panel) provides a user interface through six pushbuttons and an LCD. The rear panel holds connectors for power and for the ASI, serial, and Ethernet ports.

Figure 1.1: UMX 5010 Front Panel



1.3 UMX5010 Specifications

Table 1.1: UMX 5010 Technical Specifications

Characteristic	Specification
TAGS (Carrier IDs)	
Number of Entries	15
DVB ASI Input/Output	DVB-ASI per EN 50083-9 Annex B
Physical Layer	270 Mbaud signaling on 75-Ohm coaxial cable
Minimum Byte Gaps	Down to 0-byte interbyte gaps
Transport Stream	188-byte MPEG packets per ISO 13818-1
Transport Rate	2.5 to 100 Mbps
Inputs	Two isolated, selectable 75-Ohm inputs
Outputs	Identical, isolated 75-Ohm outputs
PCR Jitter	+/- 500 ns max peak for +/- 300 ms peak input jitter (as measured on Tek. MTS 215)
Serial Ports	
Standard	RS232, DCE
Handshaking	None
Baud Rates	Injected streams up to 38.4 kbaud

Table 1.1: UMX 5010 Technical Specifications

Characteristic	Specification
Selectable Services	COMPEL input for Transport injection CA keystream input for Transport injection Auxiliary data async input for Transport injection Terminal monitoring and control, may be tri-stated Remote terminal via modem
Formatting	8 data bits, one start, one stop-bit, half-duplex. Parity selection set by unit software.
Daisy-chaining	Serial ports with Terminal or Modem devices assigned may be "daisy-chained" because all data output lines may be tri-stated.
Transport Stream Injectors	
Overview	Up to 3 data streams injected over incoming Null TS packets. Each is simple data pipe using separate PID. Framing/format checking on COMPEL & CA inputs only.
Injection Buffer Size	Factory settable from 8 to 32 TS packets
Ethernet Port	
Physical Layer	10baseT, 100baseT (twisted pair) on RJ45 jack
Media Access and Link Layers	Per IEEE 802.3 (Ethernet)
Network and Transport Layers	Not implemented in First Release
Alarm/Warning Relays	
Type	Form C, wiper contacts NC contact when de-energized and NO contact when energized
Polarity	Internal jumper establishes whether energized state opens or closes contacts
Rating	30VDC open circuit, 100 mA max current closed
User Contact Closures	
Type	Open collector, optically-isolated
Rating	Hold off up to 30VDC when OPEN; output voltage less than 1VDC at up to 8.0 mA current when CLOSED.
Power	
Voltage	90-132 or 175-264 VAC auto-detect/selected
Frequency	60/50 Hz
Current	0.5 Amps at 115 VAC; 0.3 Amps Max at 230 VAC
Chassis	
Height	Std. 1RU 1.75 inches (4.45cm)
Width	EIA std. 19 inches (48.26cm)
Depth	Back of rack-ears to rear panel: 13 inches (33.02cm)

Table 1.1: UMX 5010 Technical Specifications

Characteristic	Specification
Environmental	
Use	Indoor
Operating Temperature	+10°C to +50°C (50°F to + 122°F) Unit gives warning indication for over-temperature conditions
Storage Temperature	-20°C to +70°C (-4°F to 158°F)
Humidity	Max. relative humidity of 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
Agency Approvals	
UL	UL1950, 3rd Edition or latest equivalent standard
FCC	Part 15B Class A
CE	EN61000-3-2, EN61000-3-3, EN60950, EN55024(1998)

1.4 Safety Summary

The **UMX 5010** is designed for safe use with few special precautions required of the user. The following items are basic precautions to use when installing and working with your **UMX 5010**:

Do not open the **UMX 5010** chassis cover.



The **UMX 5010** incorporates security labels over some of the screws. There are no user-serviceable components within the **UMX**. Tampering with these security labels or opening the unit will void your warranty. If you have questions, contact Wegener's Customer Service Department at the address or numbers listed in **Chapter 5 Customer Service** on page 47.

CHAPTER 2 INSTALLATION

This chapter provides instructions on unpacking, mounting, and connecting your **UMX 5010** as well as connector information including detailed pinouts.

2.1 Unpacking and Inspection

Carefully unpack the unit and its ac power cord and inspect for obvious signs of physical damage that might have occurred during shipment. Any damage claims must be reported to the carrier immediately. Be sure to check the package contents carefully for important documents and materials.

NOTE: Please save the packing materials and original shipping containers in case you must later return the unit for repair. Packing these units in other containers in such a way that they are damaged will void your warranty.

2.2 Location and Mounting

The **UMX 5010** may be mounted in a standard 19-inch equipment rack or set up for desk-top operation. In either location, maintain a clean, dry environment for your **UMX 5010**.

FCC-Mandated Suppression of Radiated Emissions

If the Ethernet port has a cable connected to it, that cable **MUST** be properly shielded and grounded. This must be done to minimize RF emissions which could interfere with nearby equipment.

WARNING

This is a Class A product. In a domestic environment this product may cause radio interference for which the user may need to take mitigating action.

DANGER

To avoid damage to this and other equipment, or personal injury, the following items should be strictly observed.

Elevated Operating Ambient

When equipment is installed in a closed or multi-unit rack assembly, the operating ambient of the rack environment may be greater than the room ambient. Therefore, consideration should be given to the ambient air temperature within the rack, and not just inside the room, when deciding if the maximum recommended ambient operating temperature (T_{MRA}) is being met.

Reduced Air Flow

Equipment should be installed such that airflow required for safe operation of the equipment is not compromised. The UnityMux may be arranged in a rack without empty spaces between units if heat rise is prevented by ensuring its side vents remain unblocked with adequate clearance around the vent holes.

Mechanical Loading

Mounting of the equipment in a rack should be such that a hazardous condition is not produced by uneven loading. This unit is not very heavy, but total rack loading must be considered. Also, do not rest any unsupported equipment on your **UMX 5010**.

Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on overcurrent protection and supply wiring. Ensure that the total rack or breaker power consumption does not exceed the limits of the AC branch circuit. Appropriate consideration of equipment ratings should be used when addressing this concern.

Reliable Earthing

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (use of power strips, chassis ground lugs, etc.).

Rack Mounting

The **UMX 5010** is sized at a single RU and will fit an EIA-standard, 19-inch-wide equipment rack.

- d. First install angle brackets or cross-supports capable of supporting both the unit and its connecting cables. Screw or bolt the supports securely to the equipment rack.
- e. Place the **UMX 5010** on its supports and use four anchor screws or bolts and nuts to secure the **UMX 5010** front brackets to the rack.

WARNING

The front brackets must be secured to the rack. If front brackets are left unsecured, the unit may shift forward and fall from the rack during installation or operation. Failure to secure the front brackets may result in personal injury and/or damage to the equipment.

Desktop Installation

To set up the **UMX 5010** in a desktop environment, place the **UMX 5010** on a flat surface where it will not be subject to spills or impacts. Also route cables to the unit so that they will not be hit or pulled causing damage to the connectors or to the unit itself. Ensure a sufficient flow of cool air (See "Reduced Air Flow" on page 5.) so that the unit's operating ambient temperature range is not exceeded.

WARNING

Locate the **UMX 5010** and its cables to avoid impacts, spills, and pulling cables and to ensure sufficient air flow. Failure to locate the **UMX 5010** in a proper environment may result in damage to the equipment.

2.3 UMX 5010 Connections

Figure 2.1 shows the connector locations on the UMX 5010 rear panel.

Figure 2.1: UMX 5010 Rear-Panel Connector Locations

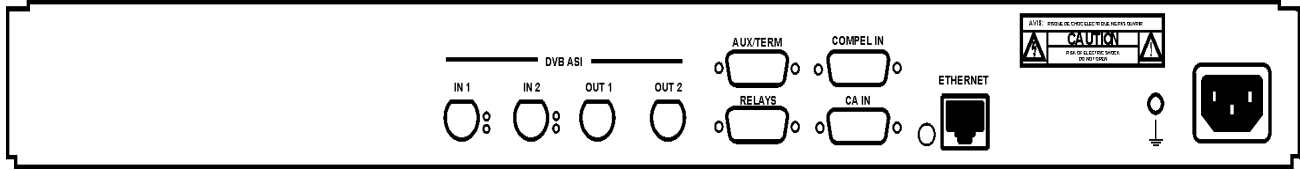


Table 2.1: , below, lists the UMX 5010 connectors, their types, and pinout information. See Rear-Panel LEDs on page 13 for descriptions of rear-panel indicators.

Table 2.1: Rear-Panel Connectors

Connector Designation	Type	Pin	Signal Name
115/230 VAC	Std IEC Receptacle		AC line in
Ethernet	RJ45 Jack	1 (on left as viewed from rear of unit)	TXDO +
		2	TXDO -
		3	RXDI +
		4	Terminated 75 Ω / 1000 pF
		5	Terminated 75 Ω / 1000 pF
		6	RXDI -
		7	Terminated 75 Ω / 1000 pF
		8	Terminated 75 Ω / 1000 pF
COMPEL IN, CA IN, AUX/TERM ports	RS232, 9-pin D female jacks	1	DCD (internally pulled to +5V)
		2	RxD (output)
		3	TxD (input)
		4	DTR (not connected)
		5	GND
		6	DSR (internally pulled to +5V)
		7	RTS (not connected)
		8	CTS (internally pulled to +5V)
		9	RI (internally pulled to +5V, with weak current limiting)

Table 2.1: Rear-Panel Connectors

Connector Designation	Type	Pin	Signal Name
Relays	RS232, 9-pin D female jack	1	CC1 -
		2	CC2 -
		3	R3 - (Warning)
		4	R4 - (Alarm)
		5	GND
		6	CC1 +
		7	CC 2 +
		8	R3 + (Warning)
		9	R4 + (Alarm)
DVB ASI In 1, 2	BNC jacks		ASI Transport Inputs #1 and #2, selectable
DVB ASI Out 1, 2	BNC jacks		ASI Transport Outputs #1 and #2

CHAPTER 3 OPERATION

3.1 Operation Overview

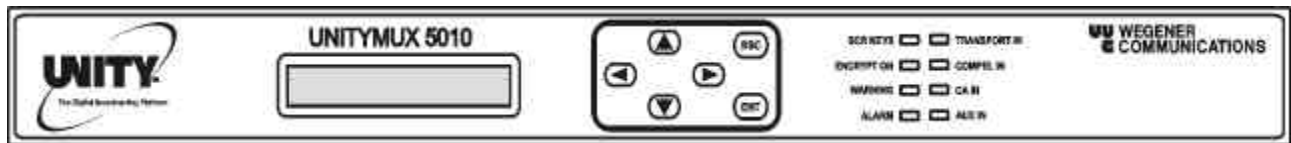
Most routine **UMX 5010** operations are performed over the **Compel** network or through a local or remote terminal. However, front-panel control is required for changing some key unit settings.

This chapter provides details about the front-panel controls and indicators, the serial ports, the alarm/warning system, and unit operation through the LCD menu screens.

3.2 Controls and Indicators

There are three major parts of your **UMX 5010** front-panel controls and indicators: the liquid-crystal display (LCD), the six push buttons, and the eight LED indicators. Essentially all control available through the terminal is also available from the front panel.

Figure 3.1: UMX 5010 Front Panel



Liquid-Crystal Display (LCD) The **UMX 5010**'s LCD indicates unit status and prompts for and reflects user input. Here, following startup, the **Unity Mux 5010** unit label is displayed on the top line and its serial number and the port number of the currently selected serial input are displayed on the bottom line. No matter where the user is in the menu hierarchy, pressing the **ESC** button repeatedly returns the LCD to the **Home screen**. Using the adjacent pushbuttons (described in the next section), you can navigate the **UMX 5010**'s various screens and edit input fields.

The front-panel LCD can also be used to view a **COMPEL**-downloadable text message (called e-mail or **COMPEL** front-panel e-mail). This message is volatile and can contain up to 512 characters. The LCD has several operating modes and screen types, and these define the behavior of the buttons.

Table 3.1: UMX 5010 LCD Modes

Mode	Description
VIEW	Information is being displayed on the LCD for the user to view. None of the pushbuttons can be used for editing in this mode.
EDIT	This mode is entered from the VIEW mode. The LCD cursor appears on the edit field and the user has the ability to edit the parameter while in this mode. The cursor will be a flashing underscore beneath the character to be edited.

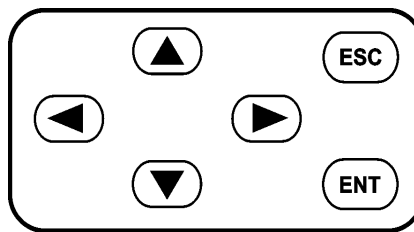
Table 3.2: UMX 5010 LCD Types

Type	Description
INFO	This is a read-only (VIEW mode) screen that displays information that is NOT editable. The Home Screen is this type of screen. Other screens of this type display the status of the UMX or display Help on how to navigate the front panel screens.
MENU	This type of screen displays the menu name for a command group. For example, this screen may name the command group for current RF settings or settings for the serial ports. The screen "beneath" a menu screen (reached by pressing ENTER) may be any of the screen types (i.e., other menus, information screens, etc. MENU screens are read-only (VIEW mode).
PARAMETER	This type of screen displays a specific parameter that CAN be edited (if the correct authority has been established). This is the only type of screen that can enter the EDIT mode. A PARAMETER screen will contain an alphanumeric or list-select field. There are no carries or borrows when wrapping on a numeric field (i.e., to go from 0999 to 1000 , all 4 digits must be edited).

Pushbuttons

The six pushbuttons on the **UMX 5010** front panel (shown in Figure 3.1) are your means of commanding the **UMX 5010** from the front panel.

Figure 3.2: UMX 5010 Front Panel Pushbuttons



The four arrow buttons allow navigation through the menu screens and parameter selections and assist editing in user-input screens. The **ENT** (Enter) button serves to select menu options (downward navigation), to open user-input fields, or to commit user input to the **UMX 5010**. The **ESC** (Escape) button allows exit from user-input fields without saving the entry or selection. **ESC** also provides upward navigation through the menu structure to the **Home** screen.

Table 3.3: UMX 5010 Front Panel Pushbutton Description

LCD Mode	Pushbutton	Screen Type	Function
VIEW	ENT	MENU	Go to next level and display the first screen on that level.
		INFO	No action.
		PARAMETER	Enter EDIT mode and set cursor on first character if alphanumeric or enable viewing of choices if field type is list select. EDIT mode is only entered if the user has the authorization to edit the parameter.
	ESC	(ALL)	Go to previous level and display the current screen OR display the first screen at the current level if already at the top level. The first screen at the top level is the HOME screen. Therefore, pressing ESC numerous times will always eventually return the user to the HOME screen.
	△	(ALL)	No action.
	▽	(ALL)	No action.
	◁	(ALL)	Display the previous screen at the current level or the last screen if currently on the first screen.
	▷	(ALL)	Display the next screen at the current level or the first screen if currently on the last screen.
EDIT	ENT	PARAMETER	Accept the current selection or changes that were made and return to the VIEW mode.
		PARAMETER	Abort any changes made to the parameter and enter the VIEW mode.
		PARAMETER	List Select: Scrolls up to next value in the list or wraps if currently on the last item in the list. Alphanumeric: Increases the value of the current field. If numeric and the current value is 9 (if decimal) or 0xF (if hex), the value will wrap to a 0. If alphanumeric, the value will wrap to the first ASCII value when at the last.
	ESC	PARAMETER	List Select: Scrolls down to previous value in the list or wraps to the last item if currently on the first item in the list. Alphanumeric: Decreases the value of the current field. If numeric and the current value is 0, the value will wrap to 9 (if decimal) or to 0xF (if hex). If alphanumeric, the value will wrap to the last ASCII value when at the first.
	△	PARAMETER	List Select: No action. Alphanumeric: Moves to the previous character. Wraps to the last character if currently at the first.
	▽	PARAMETER	List Select: No action. Alphanumeric: Moves to the next character. Wraps to the first character if currently at the last.

Front-Panel LEDs

These eight light-emitting diodes (LEDs) provide status information about your **UMX 5010** and its processes. **Table 3.4:** describes the states of each LED and the meanings of

Figure 3.3: UMX 5010 Front Panel LED Indicators

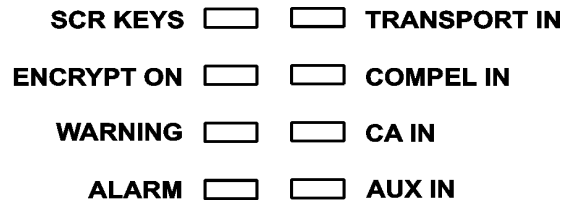


Table 3.4: UMX 5010 Front Panel LED Indicator Descriptions

Indicator Label	Color and State	Meaning
SCR KEYS	GREEN constant	A new scrambling key was successfully deciphered after the unit was last reset (or after the last command to Clear the Key). Also if PIN scrambling.
	GREEN flutter	Flutters for about 2 seconds when a new key is deciphered and stored.
	Off	No PIN scrambling and no new scrambling key has been successfully deciphered after the unit was last reset (or after the last command to Clear the Key).
TRANSPORT IN	GREEN constant	Unit can recover proper Transport stream framing from the input ASI signal.
	Off	Unit cannot recover proper Transport stream framing from the input ASI signal.
ENCRYPT ON	GREEN constant	PIN scrambling active.
	GREEN flash	If using WCI Encryption (1997 version), the unit is scrambling payload data and setting the encryption bit to ENCRYPTED on any transport stream PID being output - "odd" key is in use (scrambling payloads).
	GREEN flutter	If using WCI Encryption (1997 version), the unit is scrambling payload data and setting the encryption bit to ENCRYPTED on any transport stream PID being output - "even" key is in use.
	Off	No encryption or scrambling.
COMPEL IN	GREEN constant	Valid COMPEL control stream inputs have recently been received (during time defined by the INDICATION TIME user-set variable). This includes keep-alive packets.
	GREEN flutter	COMPEL addressed to unit within last 5 seconds (keep-alive commands are not considered to be addressed to unit).
	Off	No valid COMPEL control stream inputs have recently been received (during time defined by the INDICATION TIME user-set variable) or addressed to unit within last 5 seconds.
WARNING	YELLOW constant	A single warning condition exists.
	YELLOW flash	Two or more warning conditions exist.
	Off	No warning conditions.

Table 3.4: UMX 5010 Front Panel LED Indicator Descriptions

Indicator Label	Color and State	Meaning
CA IN	GREEN constant	Valid CA stream inputs have recently been received (during time defined by the INDICATION TIME user-set variable).
	Off	No valid CA stream inputs have recently been received (during time defined by the INDICATION TIME user-set variable).
ALARM	RED constant	An alarm condition currently exists.
	RED Blinking ON	Past (Latched) alarms exist. (May be "combined" with either of the other two LED states.)
	Off	No current or past alarm conditions exist.
AUX IN	GREEN constant	The AUX/TERM port is set for Aux data, and async data input has been detected recently (during time defined by the INDICATION TIME user-set variable).
	Off	The AUX/TERM port is not set for Aux data or async data input has not been detected recently.

NOTE: When using **2002 COMPEL/CA**, if the KMS stream is disrupted or if the ciphered scrambling seeds fail to reach the **UMX 5010**, the unit will turn off scrambling and put the signal "in the clear" at least for the remainder of that odd/even seed distribution period (typically one to two minutes). Using **1997 COMPEL/CA** under the same conditions, the **UMX 5010** will keep the signal scrambled even with the risk that downstream IRDs will "go dark".

Rear-Panel LEDs

UMX 5010 has five LED (light-emitting diode) indicators on the rear panel. They provide the indications shown in **Table 3.5**:

Table 3.5: UMX 5010 Rear Panel LED Indicator Descriptions

Indicator Label	Color and State	Meaning
Ethernet	Green ON	If broadcast or addressed packet was received by UMX in the last five seconds..
	OFF	If NO broadcast or addressed packet was received n the last five seconds.
ASI Inputs (Red/Green LED pair for each ASI Input)	Both LEDs OFF	ASI Input is not selected.
	Red ON	ASI Input is selected but not locked
	Green ON	ASI Input is selected and locked. NOTE: Lock is defined as having frame synchronization without buffer over-/under-flow for the last five seconds.

Device Port Assignments

The **UMX 5010** has three external serial ports. A *device* must be assigned once to each serial port, but no *device* may be assigned more than once. In addition, **Terminal** and **Modem** devices may not be assigned at the same time. **Device Port Assignment** and **Device Configuration** (below) may be controlled only from the unit front panel, and the network may disable this capability. The possible devices are:

- **Terminal**
- **Modem** (“modem” being remote terminal via modem)
- **Auxiliary Data**
- **CA**
- **COMPEL**

Device Configuration

When a serial port configuration command is received, the specified configuration is immediately stored for the specified device (e.g., for the **Terminal** device). If a serial port is currently assigned to another device, then its output buffer is immediately flushed and the port re-configured. Communication is fixed at **1 start**, **1 stop**, and **8 data bits**, with **no hardware handshaking**. No provision for software handshaking is made in this Release. The serial port’s behavior for each of its device types is described in **Table 3.6**:

Table 3.6: UMX 5010 Serial Port Device Configurations

Device	Serial Port Behavior (<i>Italics are Programmable, Bold are Fixed</i>)
Terminal	Configured to 19.2k, N, 8, 1 . The unit responds to the terminal commands as described in Appendix A.
Modem	Configured to B, P, 8, 1 . The unit responds to the terminal commands, as described in Appendix A.
Aux Data	Configured to B, P, 8, 1 . This is an input only.
CA	Configured to B, P, 8, 1 . This is an input only.
COMPEL	Configured to B, P, 8, 1 . This is an input only.
	The legal values for B are: 1200, 2400, 4800, 9600, 19.2k, or 38.4 kBaud . For Aux Data only, 115.2 kBaud is also allowed. The legal values for P are: O, E, or N for Odd, Even, or No parity.

Device Handling

Terminal I/O

The **Terminal** device is used for command and control of the **UMX 5010**. This I/O is a basic VT100-like emulation. All I/O is prompted by user-input text strings terminated in carriage-returns. The terminal, whether local or (via modem) remote, should be set to **local echo ON** because the unit only echoes a carriage-return/linefeed and then displays a > prompt after entry of a command line terminated in a carriage-return.

Daisy Chain Communication

The **UMX 5010** supports “*daisy-chaining*” of terminal control. This involves sharing of a serial bus between two or more UMXs. The serial bus consists of both the **TX** and **RX** serial port lines wired in parallel, connected to a serial port on all the UMXs and the terminal communication device (either a local terminal or modem).

Certain operating states are defined for the UMXs using this daisy-chain capability. These states are **Talker**, **Idle**, and **Waiting for password**. Units will transition from either **Talker** or **Idle** over to **Waiting for password** when a wakeup “hotkey” is received from the user (see **Daisy Chain Terminal Communication** on page 39). Then, after the two-digit ID passcode is

received, any unit matching that passcode proceeds to **Talker** state (and switches its serial output to **Active**), while all others proceed to **Idle**. While in an **Idle** state, a unit's serial port, which is allocated as a **Terminal** or **Modem** device has an electrically isolated (tri-state) output and responds only to a hotkey input. When in the **Talker** state, the unit issues prompts and responds to commands normally.

NOTE: These states are held only in volatile memory, and a unit reverts to the **Idle** state **during** and **after** a unit reset Modem I/O.

The unit ID may be assigned by the user and is a non-volatile setting. Assigning a unit ID of **00** effectively disables this daisy-chain capability. This leaves an UMX continuously in the normal **Talker** state, even through unit resets.

Modem I/O

The **Modem** device operates in a similar manner to the **Terminal** device. Where the **Terminal** device was limited to a specific configuration, the **Modem** device may be set to one of several. The **Modem** device does not use special handshaking or special control characters, and only supports auto-answer modems. In fact, in the standard interface, the UMX would not know if a local or remote (via modem) terminal were actually attached to the port.

To access the modem command interface, the serial-port device must first be set to **Modem** (using only the front-panel control interface). The discussion above on emulation and echoing would then apply. The user would send the unit a carriage return and then the unit would return a prompt to enter the password. If the correct password is entered, then modem access is enabled. Upon enabling modem access, the UMX will output a welcome banner. After that, I/O is indistinguishable from normal terminal access, with the same restriction on local user access as set by the Network.

Modem access is disabled when:

1. A new serial-port device is selected,
2. There is no user input for 10 minutes,
3. The **OH** command is received, or
4. The unit is reset.

Aux Data

The **Aux Data** device is defined to allow for async data streams to be carried within the transport stream and their raw payload output on an IRD serial port. The PID of these streams may or may not be assigned to a program number within a PMT. To recover the data, the IRD need only be given the PID and baud rate. The range of legal PIDs is established by the **ISO 13818** standard as **20** to **1FFE** (hex). This may be performed either by **COMPEL** command or by the local user (if local control is enabled).

CA Input

This device is defined to allow for input of the **Conditional Access** key stream (legacy term **KMS stream**). There is no output.

COMPEL

This device is defined to allow for input of the **COMPEL** control stream. There is no output.

3.3 Alarm/Warning System

The alarm and warning system is intended to provide indications to local users of a critical failure or imminent failure. The indication persists only as long as the causative condition, except where otherwise noted. See **Alarm Conditions** below for actual indications.

Alarm Conditions

Generally, an **Alarm** condition exists if the unit is unable (or presumed to be unable) to inject **COMPEL** or **CA** into an input transport stream. The following list defines all alarms during normal operation. They are listed in the order of priority by which they will be reported on the front-panel Home screen.

1. No transport stream sync on current ASI input
2. Failure of various outputs if allowed by programmable control mask. (See **Maskable Alarm and Warning Conditions** on page 16.)

During an initialization failure, the alarm relay is de-energized (**Alarm** state) and the alarm LED is ON.

Warning Conditions

Generally, the unit presents warnings when an alarm condition may be imminent from unit stress or poor signal conditions. The following list defines all warnings during normal operation. They are listed in order of priority by which they will be reported on the front-panel Home screen.

1. CA secure microprocessor run-time failure or SN mismatch (if applicable)
2. Multiple assignment of an injected PID.
3. Unit reverted to backup application software because of self-test failure of requested application (continues until user keypress).
4. Failure of various outputs if allowed by programmable control mask. (See **Maskable Alarm and Warning Conditions** below.)
5. Unit overheating.

Maskable Alarm and Warning Conditions

All the following may be unit alarms, unit warnings, or no indication, as programmed. They are listed in the order of priority by which they will be reported on the front-panel Home screen. Defaults are shown in braces {}.

- | | |
|---|------------------------------|
| 1. No COMPEL stream input. | {Default: Warn on failure} |
| 2. Serial data injection buffer overflow. | {Default: Alarm on failure.} |
| 3. Incoming COMPEL Header does not match unit's COMPEL Header settings. | {Default: Warn on failure} |
| 4. Serial data injection buffer >75%. | {Default: Warn on failure} |
| 5. No addressed COMPEL received. | {Default: No Indication} |
| 6. No CA stream input. | {Default: No Indication} |
| 7. No Aux data input, if port is designated for Aux data. | {Default: Warn on failure} |
| 8. No Scrambling keys deciphered. | {Default: No Indication} |
| 9. Encryption OFF. | {Default: No Indication} |
| 10. No scrambling key. | {Default: No Indication} |
| 11. No tags sites assigned. | {Default: Warn on failure} |
| 12. No ID tags transmitted. | {Default: Warn on failure} |
| 13. Other option card output failures. | {Default: No indication} |

3.4 Menu Screens

Table 3.7: UMX 5010 LCD Menu Screens

Main Level	Second Level	Third Level	Fourth Level
Home Screen			
Software Download Screen (when applicable)	Indicator Screens		
Warning/Alarm Screen (shown if applicable)	Current Alarms	Individual Alarm Message Screens	
	Current Warnings	Individual Warning Message Screens	
	Past (Latched) Alarms (shown if applicable)	Individual Alarm Message Screens	
	Clear Latched Alarms? (shown if applicable)		
EMAIL	Read Email Message		
CA Override Selection (when available)			
Transport Input Setup	Current ASI Input Port		
	ASI Auto-switch Enable		
	ASI Auto-switch Timeout		
Injected Stream Setup	COMPEL Input Setup	PID Assignment	
		Priority (Time or Space)	
	CA Input Setup	PID Assignment	
		Priority (Time or Space)	
	AUX Data Input Setup	PID Assignment	
		Priority (Time or Space)	
CA Setup (when available)	CA Type (PIN, COMPEL/CA, etc.)		
	Partition Scrambling Enable		
	CA Scrambler Partition PID (if partition scrambling enabled)		
	Fixed Key WCI Encryption Enable (If partition scrambling is disabled)	Load Next	
	PIN Scrambling Key		
	Encryption Control Table (when available)		

Table 3.7: UMX 5010 LCD Menu Screens

Main Level	Second Level	Third Level	Fourth Level	
Carrier ID Tags Setup	Edit or Disable Site	Edit Site		
Serial Port Devices	AUX/TERM Port Device Selection			
	Unit ID, Terminal Control			
	Serial Device Setup	Modem Settings	Password	
			Baud Rate	
			Parity	
		Printer Settings (when available)	Email Enable	
			Baud Rate	
			Parity	
		Aux Data Settings	Baud Rate	
			Parity	
		COMPEL Settings	Baud Rate	
			Parity	
		CA Settings	Baud Rate	
			Parity	
Misc Setups	Unit Label			
	Indicator Response Setup	COMPEL In Timeout		
		CA In Timeout		
		Aux Data In Timeout		
	Solid-state Closure Setup	Contact #1 Status		
		Contact #2 Status		
	Alarm Latching Enable			
	Unit S/W Switch to Backup			
Reset Unit				

Table 3.7: UMX 5010 LCD Menu Screens

Main Level	Second Level	Third Level	Fourth Level
Unit Status	ASI Transport	Current	
		Lost-lock Events	
	COMPEL Data Stream	Current	
		Number/Time of lost input events	
	CA Data Stream	Current	
		Number/Time of lost input events	
	AUX Data Stream (only shown when AUX device is assigned to AUX/TERM port)	Current	
		Number/Time of lost input events	
	Serial Data Injection Buffer	Current	
		Buffer Overflow	
	Transport Stream Status	Estimated Data Rate	
		NULL Packet Bandwidth	
		NULL Packet Percentage Used	
	Time Since Log Last Cleared		
Clear Logs			
Network Control Status (when available)	Delaying Log		
	Serial Number, COMPEL lock status, COMPEL-required setting		
	Local Control Enable status, Network Protection mode		
	Time since Last Header, Time since Last addressed Header		
	Total History, Total processed COMPEL packets		
	Packets with invalid Header, Packets with invalid Checksum		
	Packets with Invalid length, Buffer overflow		
	Packets with syntax errors		

Table 3.7: UMX 5010 LCD Menu Screens

Main Level	Second Level	Third Level	Fourth Level
Current Version Info	Application, current		
	Application, backup		
	Boot Loader		
	MP PWA ID		
	MP Xilinx Version		
	MP Lattice Version		
	CA Secure Microprocessor		
	CA Scrambler		
Navigation Help	Pressing <ENTER>		
	Pressing <ENTER> (more)		
	Pressing Rt/Left arrows		
	Pressing Rt/Left arrows (more)		
	Pressing Up/Down arrows		
	Pressing <ESCAPE>		

Default LCD Screens

No matter where a user may be in the LCD menu hierarchy, if no front-panel keypress is made for more than 5 minutes, then the **LCD Menu State** reverts to the default screen. The default screen is always a *Main Level* screen as defined in Table 3.7 above. Typically, this is the “**Home Screen**.” However, there are events where this rule must be overridden. If any of the conditions listed below apply, then the alternate screen given becomes the default. If more than one applies simultaneously, then the priority follows the list order. (Note that if more than one applies simultaneously, the user may still access all the applicable screens by using an arrow key to traverse the **Main Level**.)

If the UMX is in an **ACCEPT PACKETS Download** state, then the **Download** screen becomes the default.

If there are current **Alarm** or **Warning** conditions, then the **Alarm** screen becomes the default.

If there is unread front-panel e-mail stored in the unit, then the **EMAIL** screen becomes the default.


```

DOWNLOAD TIMEOUT-
TIME REMAINING:mm:ss
    
```

mm:ss is time remaining before the download timeout expires (in minutes:seconds).

```

APP:WAITING  CYCLE #
      mm:ss      YY
    
```

mm:ss is the elapsed time since the last download-data-bearing **COMPEL** packet was received (in minutes:seconds),
and yy is the number of consecutive download attempts.

**Warning/
Alarm
Screens**

At the main menu level, the following screen is displayed *only* if an **Alarm** or **Warning** condition is active. (See **Default LCD Screens** on page 20 for rules on default screens.)

```

WARNING/ALARM  INFO
SELECT? Press <ENT>
    
```

If **ENT** is pressed, the user is taken to the set of second-level menus shown below:

Current Alarm Screen

```

CURRENT ALARMS:
SELECT? Press <ENT>
    
```

If **ENT** is pressed, the user is presented with (one or more) third-level **Alarm** screens, displayed in the order of alarm priority:

```

CURRENT ALARM
XXXXXXXXXXXXXXXXXXXXXXXXX
    
```

where the xx...xx string is a description of the **Alarm** condition.

Current Warning Screen

```

CURRENT WARNINGS:
SELECT? Press <ENT>
    
```

If **ENT** is pressed, the user is presented with (one or more) third-level **Warning** screens, displayed in the order of warning priority:

```

CURRENT WARNING
XXXXXXXXXXXXXXXXXXXXXXXXX
    
```

where the xx...xx string is a description of a **Warning** condition.

Latched Alarm Screen

```
PAST ALARMS:
SELECT? Press <ENT>
```

If **ENT** is pressed, the user is presented with (one or more) third-level **Alarm** screens, displayed in the order of alarm priority:

```
PAST ALARM
XXXXXXXXXXXXXXXXXXXXXXXXXX
```

where the **xx...xx** string is a description of the **Alarm** condition.

Clear Latched Alarms Screen

```
CLEAR ALARM HISTORY?
Press <ENT>
```

If **ENT** is pressed, all **Latched Alarms** are immediately cleared.

EMAIL

At the main menu level, one of three screens shown below is always displayed, depending on the status of e-mail. Note that if there is **unread** e-mail, this may be the default unit LCD screen. (See **Default LCD Screens** on page 20 for rules on default screens.) Pressing the **>** button brings up the next main-level screen, **CA OVERRIDE**.

No email present:

```
EMAIL: NONE
```

Email present, but not yet viewed:

```
EMAIL READ:<ENTER>
```

E-mail present and already viewed:

```
EMAIL READ:<ENTER>
CLEAR:<ESCAPE>
```

From the third screen above, pressing **ESC** clears the e-mail buffer and sends the user back to first (**None**) e-mail screen. If **ENT** is pressed on one of the above screens showing that e-mail is present, the following second-level screen appears, with the start of the e-mail message left justified on the LCD bottom row.

```
< EMAIL MESSAGE >
THE QUICK BROWN FOX
```

The symbols **<** and **>** are shown when scrolling is necessary to view an email message. Each key press of the left (or right) arrow moves the text by two to four characters. The slash (**//**) marks signify the start or end of the message. (It will wrap on the screen as shown below.) To exit these screens for the **EMAIL READ/CLEAR** screen above, press **ESC**.

```

<  EMAIL MESSAGE  >
  E LAZY DOG//THE QUIC
    
```

CA Override

NOTE: This screen is only shown when **WCI Encryption** is installed:

```

CA OVERRIDE
SELECTION:  xxxxxxxx
    
```

Where **xx...xx** may be either:

- CLEAR** (forcing encryption **OFF** at all times) or
- EXT CNTL** (under control of the external **COMPEL CA** system).

Pressing the **▷** button brings up the next main-level screen, **TRANSPORT INPUT**.

Transport Input Setup

```

TRANSPORT INPUT
SETUP  Press <ENTER>
    
```

Pressing **ENT** brings up the second-level screens under **Transport Input Setup** shown below. (Pressing the **▷** button brings up the next main-level screen, **INJECTED STREAM INPUT**.)

```

CURRENT ASI INPUT
PORT:  x
    
```

Where **x** is either **1** or **2** to designate the active **ASI input port**.

```

ASI INPUT PORT
AUTO-SWITCH:  xxxxxxxx
    
```

Where **xx...xx** is either **ENABLE** or **DISABLE**. **ENABLE** forces the unit to automatically select the backup ASI input if a transport stream is not detected at the currently selected primary port.

```

ASI AUTO-SWITCH
TIMEOUT:  mm:ss
    
```

Where **mm:ss** is the specified length of the timeout in **minutes:seconds**. After loss of transport stream is detected on the current primary port, the backup port will become the new current primary port after the specified timeout has expired.

Injected Stream Setup

**INJECTED STREAM
SETUP Press <ENTER>**

Pressing **ENT** brings up the second-level screens under **INJECTED STREAM INPUT** shown below. (Pressing the **▷** button brings up the next main-level screen, **CONDITIONAL ACCESS SETUP**, which is available *only* when **WCI Encryption** is installed. If that screen is not installed, it moves to the next main-level screen, **CARRIER ID TAGS SETUP**.)

COMPEL Input

**COMPEL INPUT
SETUP Press <ENTER>**

Pressing **ENT** brings up the third-level screens under **COMPEL Input**. (Pressing the **▷** button brings up the next second-level screen, **CA INPUT**.)

**PID ASSIGNMENT (HEX)
XXXX**

Where **xxxx** is the **PID** to be used for the **COMPEL Control** stream.

**PRIORITY
XXXXXXXXXX**

Where **xx...xx** is either **LATENCY** or **BANDWIDTH**.

CA Input

**COND. ACCESS INPUT
SETUP Press <ENTER>**

Pressing **ENT** brings up the third-level screens under **CA INPUT**. (Pressing the **▷** button brings up the next second-level screen, **AUX DATA INPUT**.)

**PID ASSIGNMENT (HEX)
XXXX**

Where **xxxx** is the **PID** to be used for the **CA Control** stream.

**PRIORITY:
XXXXXXXXXX**

Where **xx...xx** is either **LATENCY** or **BANDWIDTH**.

AUX Data Input

**AUXILIARY DATA INPUT
SETUP Press <ENTER>**

Pressing **ENT** brings up the third-level screens under **AUX DATA INPUT**. (Pressing the **▷** button returns the LCD screen to the original second-level screen, **COMPEL INPUT**.)

**PID ASSIGNMENT (HEX)
xxxx**

Where **xxxx** is the **PID** to be used for the **Aux Data** stream.

**PRIORITY:
xxxxxxxxxx**

Where **xx...xx** is either **LATENCY** or **BANDWIDTH**.

**Conditional
Access Setup**

NOTE: This branch of the menu tree is only shown when **WCI Encryption** is installed, otherwise the next main-level screen, **CARRIER ID TAGS SETUP** is displayed.

**CONDITIONAL ACCESS
SETUP Press <ENTER>**

Pressing **ENT** brings up the second-level screens under **CONDITIONAL ACCESS** shown below. (Pressing the **▷** button brings up the next main-level screen, **CARRIER ID TAGS SETUP**.)

CA Type

**CA TYPE:
xxxxxxxxxxxxxxxx**

Where **xx...xx** is the **CA Type**, either **PIN**, **1997 COMPEL/CA**, **2002 COMPEL/CA**, or **NONE**. (Pressing the **▷** button brings up the next second-level screen, **PARTITION SCRAMBLING**.)

NOTE: When using **2002 COMPEL/CA**, if the **KMS** stream is disrupted or if the ciphered scrambling seeds fail to reach the **UMX 5010**, the unit will turn off scrambling and put the signal "in the clear" at least for the remainder of that odd/even seed distribution period (typically one to two minutes). Using **1997 COMPEL/CA** under the same conditions, the **UMX 5010** will keep the signal scrambled even with the risk that downstream **IRDs** will "go dark".

Partition Scrambling

**PARTITION SCRAMBLING
xxxxxxxxxxxxxxxx**

Where **xx...xx** is **ENABLED** or **DISABLED**. When **ENABLED**, pressing the **▷** button brings up the second-level screen, **CA SCRAMBLER PARTITION ID**. When **DISABLED**, pressing the **▷** button brings up the second-level screen, **FIXED SCRAMBLER KEY**.

CA Scrambler Partition PID

```

CA SCR PARTITION PID
      xxxxx
    
```

If the **CA Type** is **Partitioned CA** (legacy **WCI '97 CA** scrambling, which scrambles only the "upper PIDs"), then **xxxx** is the **PID** value in *hex* at and above which the **CA** system will scramble all PIDs (except the **NULL PID**).

Encryption Control Table

If the **CA Type** selected allows PID spaces or programs to be individually selected for encryption, then the second-level screen to enable setup of that feature is included here:

```

CONDITIONAL ACCESS
SETUP   Press <ENTER>
    
```

Fixed Key Encryption

If the **CA Type** selected is **97 COMPEL/CA** or a similar system that normally distributes a changing key, then the following screen is shown:

```

FIXED SCRAMBLER KEY
      xxxxxxxxxxxx
    
```

Where **xx...xx** is either **ENABLED** or **DISABLED**. If **ENABLED**, the last key received is used to scramble the selected portion of the transport stream indefinitely.

If the **FIXED SCRAMBLER KEY** is **DISABLED**, pressing **ENT** brings up the **LOAD SCRAMBLER KEY** screen shown below. Pressing the **▷** button brings up the next second-level screen, **PIN SCRAMBLE KEY**.

```

LOAD SCRAMBLER KEY
      Press <ENTER>
    
```

If **ENTER** is pressed, the next key with opposing odd/even polarity from the current fixed key is loaded (when it is received).

PIN Scrambling Key

```

PIN SCRAMBLE KEY
      xxxxxx
    
```

where **xxxxx** is the **PIN-scrambling key**, for use when/if **PIN** scrambling is selected. Pressing the **▷** button brings up the original second-level screen, **CA TYPE**.

Carrier ID Tags Setup

```
CARRIER ID TAG TABLE
SETUP Press <ENTER>
```

Pressing **ENTER** moves the user to the second-level screens shown below. Pressing **▷** brings up the next main-level screen, **SERIAL PORT DEVICES**.

There are 15 second-level **TAG SITE** screens, where **nn** increments from **00** to **14**, with one screen for each **TAG SITE**.

```
TAG SITE #nn
xxxxxxx fffff.ff MHz
```

where **xx...xx** is either **EDIT** or **DISABLED** (starting with **EDIT**). If **ENTER** is pressed while (or after) **EDIT** is selected, then the user is sent to a third-level **TAG SITE EDITING** screen shown below. When the third-level screen is entered, the user will already be in **EDIT** mode.

If **xx...xx** is **DISABLED**, the **Carrier ID Tag Frequency** is hidden, as shown.

```
TAG SITE #nn
DISABLED
```

If **ENTER** is pressed while **DISABLED** is selected, the **DISABLED** selection will be latched, and no data for that **TAG SITE** is included in the **Carrier ID** message. To see or change the **Carrier ID Tag Frequency**, you must select **EDIT**, and then press **ENT** to move to the third-level screen:

```
TAG SITE #nn
EDITING: fffff.ff MHz
```

where **ffff.ff** is the **Carrier ID Tag** in MHz (with two decimal places). This represents the downlink carrier frequency of a particular "hop".

Serial Inputs Setups

```
SERIAL PORT DEVICES
Press <ENTER>
```

Pressing **ENTER** sends the user to the second-level screen **AUX/TERM PORT DEVICE** screen shown below. Pressing **▷** brings up the next main-level screen, **MISC SETUPS**.

Aux/Term Port Device Selection

```
AUX/TERM PORT DEVICE
SELECT: xxxxxxxx
```

where **xx...xx** is either **MODEM**, **TERMINAL**, **AUXDATA**, **PRINTER** (when available), **NONE**, or **LOCAL COMPEL** (when available). This is the selected device for the **Aux/Term** port. Pressing **▷** brings up the next second-level screen, **UNIT ID TERM CONTROL**.

Unit ID, for Daisy-chained Shared Serial Bus

```
UNIT ID TERM CONTROL
uu
```

where **uu** is the **Unit ID** number between **01** and **99**. If **00** is assigned, the unit is always a **Talker** and normal terminal access is enabled permanently. Pressing **▷** brings up the next second-level screen, **SERIAL DEVICE SETUP**.

Serial Device Setups

```
SERIAL DEVICE SETUP
Press <ENTER>
```

Pressing **ENTER** moves the user to the third-level screens shown below. Pressing **▷** brings up the original second-level screen, **AUX/TERM PORT DEVICE SELECT...**

```
COMPEL SETTINGS
Press <ENTER>
```

This is the **COMPEL** data input settings screen. Press **ENT** to go to **CA SETTINGS**.

```
CA SETTINGS
Press <ENTER>
```

This is the **CA** data input settings screen. Press **ENT** to move to **MODEM SETTINGS**.

```
MODEM SETTINGS
Press <ENTER>
```

This is the **MODEM** data input settings. Press **ENT** to move to **PRINTER SETTINGS**

```
PRINTER SETTINGS
Press <ENTER>
```

This is the **PRINTER** data input settings. Press **ENT** to go to **AUXDATA SETTINGS**.

```
AUXDATA SETTINGS
Press <ENTER>
```

This is the **AUXDATA** data input settings. Press **ENT** to return to **COMPEL SETTINGS**.

Serial Device Settings

Pressing **ENTER** at any of the above **SERIAL DEVICE SETUP** third-level screens moves the user to the fourth-level menus.

NOTE: The screens below are shown **ONLY** when applicable (and available) for the device selected.

COMPEL IN:
mm:ss

where **mm:ss** is the number of minutes and seconds allowed to elapse after the loss of **WCI COMPEL** packets on the **COMPEL Input** before an indication (warning or alarm) is shown.

COND. ACCESS IN:
mm:ss

where **mm:ss** is the number of minutes and seconds allowed to elapse after the loss of **WCI COMPEL/CA** ciphered messages on the **CA Input** before an indication (warning or alarm) is shown.

AUXILIARY DATA IN:
mm:ss

where **mm:ss** is the number of minutes and seconds allowed to elapse after the loss of **Aux Data** on the **AUX/TERM Input** (only applicable when the **AUX DATA** device is selected) before an indication (warning or alarm) is shown. (Loss of data is indicated by loss of any valid data received by the **UART**.)

User (solid-state) Contact Closures

**SOLID-STATE CLOSURE
SETUP? Press <ENTER>**

Pressing **ENTER** moves user to third-level screens shown below. Pressing the **▷** button brings up the next second-level screen, **UNIT SOFTWARE SWITCH TO B-UP**.

CONTACT #1 STATUS:
xxxxxxxxxxxxxxxx

where **xx...xx** is the currently selected setting (**Open**, **Closed**, or **Follow Encr State**) of **Contact Closure #1**. If the contact closure follows the **CA** state, then it is **Closed** for **CA active**, and **Open** for **CA inactive (Off)**.

CONTACT #2 STATUS:
xxxxxxxxxxxxxxxx

where **xx...xx** is the currently selected setting (**Open** or **Closed**) of **Contact Closure #2**.

Alarm Latching Enable

```
ALARM LATCHING
SETUP Press <ENTER>
```

where pressing **ENT** leads the user to **ALARM LATCHING EDIT** screen below.

```
ALARM LATCHING
XXXXXXXXXXXXX
```

where **xx...xx** is either **ENABLE** or **DISABLE**, and controls whether **Alarm Latching** is **ON** or **OFF**.

Application Software Switch

```
UNIT SOFTWARE SWITCH
TO B-UP Press <ENTER>
```

where pressing **ENTER** leads the user to the third-level screens below. Pressing **▷** brings up the next second-level screen, **TO RESET UNIT**.

```
SW FROM xxxxx TO
yyyy Press <ENTER>
```

where **xxxx** is the version string of the currently running software, and **yyyy** is the version string of the backup software to which the unit will be switched.

NOTE: Activating the **UNIT SOFTWARE SWITCH** will cause a **Unit Reset**.)

Reset Unit

```
TO RESET UNIT:
Press <ENTER>
```

Pressing **ENTER** forces the **iPump** unit to reset immediately. Pressing **▷** brings up the original second-level screen under **MISC SETUPS, UNIT LABEL**.

Unit Status

```
UNIT STATUS
Press <ENTER>
```

Pressing **ENTER** sends the user to second-level screens shown below. Pressing **▷** brings up the next main-level screen, **NETWORK CNTL STATUS**.

ASI Transport

```
ASI TRANSPORT STATUS
Press <ENTER>
```

Pressing **ENTER** sends the user to third-level screens shown below. Pressing **▷** brings up the next second-level screen, **COMPEL STRM STATUS**.

```
CURRENT STATUS:
PORT Y          xxxxxxxx
```

where **xx...xx** is either **LOCKED** or **UNLOCKED**. This indication will dynamically update.

```
LOST LOCKS:      nnnnn
LAST EVT: hhhh:mm:ss
```

where **nnn** is the total number of lost-lock events logged on the currently selected ASI port and **hhhh:mm:ss** is the time since the last lost-lock event occurred. (The second line will read **LAST EVT: N/A**, if no events have occurred since last **CLEAR LOG** command.) Pressing **▷** brings up the third-level screen, **CURRENT STATUS**, shown below under **COMPEL STRM**.

COMPEL Stream

```
CONTROL STRM
STATUS Press <ENTER>
```

Pressing **ENTER** sends the user to third-level screens shown below. Pressing **▷** brings up the next second-level screen, **COND ACCESS STRM STATUS**.

```
CURRENT STATUS:
                xxxxxxxxxxxx
```

where **xx...xx** is either **PRESENT** or **NOT PRESENT**. This indication will dynamically update.

```
LOST-INPUTS:    nnnnnn
LAST EVT: hhhh:mm:ss
```

where **nnn** is the total number of lost-input events logged on that serial input. And **hhhh:mm:ss** is the time since the last lost-lock event occurred. (The second line will read **LAST EVT: N/A**, if no events have occurred since last **CLEAR LOG** command.)

CA Stream

```
COND ACCESS STREAM
STATUS Press <ENTER>
```

Pressing **ENTER** sends the user to third-level screens shown below. Pressing **▷** brings up the next second-level screen, **DATA INJECT BUFFER**.

```
CURRENT STATUS:
                xxxxxxxxxxxx
```

where **xx...xx** is either **PRESENT** or **NOT PRESENT**. This indication will dynamically update.

```

LOST-INPUTS:  nnnnn
LAST EVT:  hhhh:mm:ss
    
```

where **nnn** is the total number of lost-inputs events logged on that serial number and **hhhh:mm:ss** is the time since the last lost-lock event occurred. (The second line will read **LAST EVT: N/A**, if no events have occurred since last **CLEAR LOG** command.)

Aux Data Stream

NOTE: The following screen is only shown if an **AUX DATA** device is assigned to the **AUX/ TERM** serial port.

```

AUX DATA STREAM
STATUS Press <ENTER>
    
```

Pressing **ENTER** sends the user to third-level screens shown below.

```

CURRENT STATUS:
xxxxxxxxxxx
    
```

where **xx...xx** is either **PRESENT** or **NOT PRESENT**. This indication will dynamically update.

```

LOST-INPUTS:  nnnnnn
LAST EVT:  hhhh:mm:ss
    
```

where **nnn** is the total number of lost-input events logged on that serial input and **hhhh:mm:ss** is the time since the last-lock event occurred. (The second line will read **LAST EVT: N/A**, if no events have occurred since last **CLEAR LOG** command.)

Serial Data Injection Buffer

```

DATA INJECT BUFFER
STATUS Press <ENTER>
    
```

Pressing **ENTER** sends the user to the third-level screens shown below. Pressing **▷** brings up the next second-level screen, **TRANSPORT STREAM STATUS**.

```

CURRENT STATUS:
xxxxxxxxxxx
    
```

where **xx...xx** is either **OK**, **>75%** (in the last ~30 seconds), or **OVERFLOW** (in the last ~30 seconds). This indication will dynamically update.

```

BUF OVERFLOWS:  nnnnn
LAST EVT:  hhhh:mm:ss
    
```

where **nnn** is the total number of buffer overflow events logged on that serial input and **hhhh:mm:ss** is the time since the buffer overflow event occurred. (The second line will read **LAST EVT: N/A**, if no events have occurred since last **CLEAR LOG** command.)

Transport Stream Status

```

TRANSPORT STREAM
STATUS Press <ENTER>
    
```

Pressing **ENTER** sends the user to the third-level screens shown below. Pressing **▷** brings up the next second-level screen, **TIME SINCE LOG CLEARED**.

```

ESTIMATED DATA RATE
xxx.xxx Mbps
    
```

where **xxx.xxx** is the transport stream **DATA RATE** (averaged over 10 seconds).

```

NULL PCKT BANDWIDTH:
xxxxx.xx Kbps
    
```

where **xxxxx.xx** is the **NULL** packet bandwidth in the transport stream (averaged over 10 seconds).

```

NULL PCKT %% USED:
xxx.x%
    
```

where **xx.x** is the percentage of all **NULL** packets being used.

Time Since Log Was Cleared

```

TIME SINCE LOG
CLEARED: hhhh:mm:ss
    
```

where **hhhh:mm:ss** is the time since the log was last cleared. Pressing **▷** brings up the next second-level screen, **Clear Logs**.

Clear Logs

```

To Clear Event Logs
Press <ENTER>
    
```

Pressing **ENTER** clears the non-volatile event logs displayed in this section. After pressing **ENTER**, a message will be displayed indicating that the logs have been cleared. Pressing **▷** brings up the original second-level screen under **UNIT STATUS, ASI TRANSPORT STATUS**.

Network Control Status

NOTE: This branch of the menu tree is only shown when **COMPEL** control is available:

```

NETWORK CNTL STATUS
Press <ENTER>
    
```

Pressing **ENTER** sends the user to second-level **INFO** screens. Pressing **▷** brings up the next main-level screen, **CURRENT VERSION INFO**.

NOTE: All counters listed in this section reset to zero at unit reset, and count up indefinitely afterward.

```
DELAYING:    hh:mm:ss
```

Delay before execution of **COMPEL** command (refer to the **COMPEL ICD**), where **hh:mm:ss** is time in hours, minutes, seconds. If no delay is applicable, **N/A** will be shown in place of a time.

```
S/N: ssssss  xxxxxxxx
COMPEL: yyyyyyyyyyyy
```

where **ss...ss** is unit serial number, **xx...xx** is the **COMPEL LOCK** status (**LOCKED** or **UNLOCKED**) and **yy...yy** is the **COMPEL REQUIRED** status (**REQUIRED** or **NOT REQUIRED**).

```
LOCAL CTRL:  xxxxxxxx
NETWRK MODE: yyyyyyyy
```

where **xx...xx** is the **LOCAL CONTROL ENABLE** status (**ENABLED** or **DISABLED**) and **yy...yy** is the **NETWORK PROTECTION** mode (**PROTECTD** or **SHARED**).

```
LAST HDR:    hh:mm:ss
LAST ADR:    hh:mm:ss
```

where **LAST HDR** specifies the elapsed time (**hhh:mm:ss**) since the last **COMPEL** packet with a valid network header was received, and **LAST ADR** specifies the elapsed time (**hhh:mm:ss**) since the last **COMPEL** packet with a valid header was addressed to this particular IRD.

```
HISTORY:    hhhh:mm:ss
TOT PROCESSED xxxxxx
```

where **HISTORY** specifies the elapsed time (**hhh:mm:ss**) since the unit's last reset. **xx...xx** is the total number of **COMPEL** packets processed (including **Keep-alives**). See the **COMPEL ICD** for additional information.

```
INVALID HEADR: xxxxxx
INVALID CKSUM: yyyyyy
```

where **xx...xx** is the total number of **COMPEL** packets with **INVALID HEADERS** received. **yy...yy** is the total number of **COMPEL** packets received whose computed checksums did not match the transmitted values.

```
INVALID LENGTH: xxxxxx
BUFFER OVRFLOW: yyyyyy
```

where **xx...xx** is the total number of **COMPEL** packets received whose length did not appear to match the transmitted **LENGTH** value. **yy...yy** is the total number of times the **BUFFER** (storage space) for **COMPEL** packet processing was exceeded, and some packets were lost.

**Current
Version
Information**

```
SYNTAX ERRORS:
XXXXXXXXXX
```

where **xx...xx** is the total number of **COMPEL** packets received with **SYNTAX ERRORS**.

NOTE: The following screens may be used to get information on the currently loaded application software and other programmable components.

```
CURRENT VERSION INFO
Press<ENTER>
```

Pressing **ENTER** moves user to second-level screens under **VERSION**. Pressing **▷** brings up the next main-level screen, **NAVIGATION HELP**.

```
APPLICATION CURRENT:
XXXXXXXXXX
```

xx...xx is version number of the current unit application software.

```
APPLICATION BACKUP:
XXXXXXXXXX
```

xx...xx is version number of the backup unit application software (if it exists).

```
BOOT LOADER:
XXXXXXXXXX
```

where **xx...xx** is version number of the boot loader code.

```
MP PWA VERSION:
xy                xy
```

where **x** is a *hex code* for the **Main Processor PWB** assembly revision level (**A=1, B=2**, etc.) and **y** is a *hex code* for **TYPE** (one of a series of parts lists built on a **PWB**, where **700011-03** is **Type 3**).

```
MP XILINX VERSION:
XXXXXXXXXX
```

where **xx...xx** is the version string of the installed **Xilinx FPGA** programming software on the **MP PWA**.

```
MP LATTICE VERSION:
XXXXXXXXXX
```

where **xx...xx** is the version string of the installed **Lattice CPLD** programming software on the **MP PWA**.

```
CA SECURE MICRO:
xxx
```

where **xxx** is the version number of the secure (decryption) microprocessor. **NOT INSTALLED** indicates that the **CA Secure Microprocessor** option has **NOT** been installed.

```
CA SCRAMBLER:
xxxxxxxxxxxxxx
```

Shows the installed **CA Descrambler**, where **xx...xx** is either **NONE**, **1ST GEN WCI** (for 1997 **WCI** encryption), **2ND GEN WCI** (for 2nd-generation **WCI** encryption), **PIN** (for **PIN** scrambling), or **DVB** (for **DVB** common scrambling).

Navigation Help

```
NAVIGATION HELP
Press<ENTER>
```

After pressing **ENTER**, the following screens are automatically displayed in order by pressing the **▷** button. Pressing the **▷** button again brings up the **UMX 5010 Home** screen.

```
Press <ENT> to go dn
lvl or start edit
```

```
Press <ENT> to
accept changes ALSO
```

```
Press <-or-> to
traverse a menu lvl
```

```
Press <-or-> in edit
switches fields ALSO
```

```
Press <Up-Dn> to
change value in edit
```

```
Press <ESC> to go up
lvl or cancel edit
```

```
DONE?
Press <ESCAPE>
```

Control pauses here until the user presses **ESCAPE**. Then the user is returned to the **NAVIGATION HELP** screen as if **ESC** had been pressed twice.

3.5 Terminal/Modem Mode

The following discussions apply to both the **Terminal** and **Modem** devices. Once a user has fulfilled the password requirement for **Modem** access, the communication is identical to **Terminal** control.

Daisy Chain Terminal Communication

The wakeup *hotkey* is **Control-w**. This is ASCII hex code **17**. After the hotkey is sent, the very next two characters must match the previously assigned **Unit ID**. Failure on any character forces the unit back to an **Idle** state where all communication to the **Terminal** (or **Modem**) device is blocked.

NOTE: If accessing a unit on a shared serial bus via modem, the user must first get the UMX to become a **Talker**, as described under **Device Handling** on page 14, then issue a carriage-return to get the prompt for the modem password.

Overview and Syntax

Commands listed in this section detail command syntax and action taken. Commands consist of a **command** field and a *parameter* field. Each **command** field and *parameter* field is space-delimited. *Optional parameters* are indicated by square brackets, [], and *conditional parameters* are indicated by braces, {}.

For example, **COMMAND_NAME** *parameter1* {*parameter2*} [*parameter3*] indicates that *parameter1* must be entered, *parameter2* may be entered only when a certain condition is met (certain option is installed, etc.), and *parameter3* is optional. Both commands and parameters may be entered in upper or lower case; the interface is not case-sensitive.

Incorrect or incomplete commands result in **Invalid Command** being displayed at the terminal. Parameter errors on User commands generate **Invalid parameter name**, where *parameter name* is the name of the incorrectly entered parameter.

User Commands

Those commands allowed only if the network enables local control are given in the section below. Local user commands that are always functional are given in the next section, **Local Control Commands** on page 41.

Table 3.8: UMX5010 Network-Enabled Local Control Commands

ADDTAG <i>site freq</i>	
<i>site:</i>	Any two-digit number between 00 and 14 inclusive.
<i>freq:</i>	Site downlink carrier frequency in MHz. Resolution down to 0.01 MHz.
APPSWITCH	
Unloads the currently executing application software and, instead, loads and runs the backup software.	
ASI <i>port</i> [<i>auto-enable</i>] [<i>time</i>]	
<i>port:</i>	Either 1 or 2.
<i>auto-enable:</i>	Set to NO to allow auto switching. Set to OFF to disable auto switching.
<i>time:</i>	Sets the Auto-switch timeout, if the auto-enable parameter is ON .
Sets the current selected ASI Transport input <i>port</i> and establishes whether the unit will switch the selection to the current backup after losing Transport stream lock for the selected <i>time</i> .	

Table 3.8: UMX5010 Network-Enabled Local Control Commands

CA param	
param:	C for Clear forces CA OFF . E for External forces the unit to follow the setting from the external system.
CA override:	Allows the external key management system (usually COMPEL/CA) to dictate the activation of the encryption scrambler or forces it OFF regardless of the external system's instructions.
DELTAG site	
site:	Any two digit number between 00 and 14 inclusive or ALL to delete all tags.
Deletes a Carrier ID tag site (or all tags) from the Tag Table .	
FIXKEY on/off	
on/off:	ON fixes the last de-ciphered key as the scrambling key indefinitely. OFF forces the unit to use new keys as they are input on the CA port and de-ciphered. Omitting the parameter while using fixed keys will cause the next de-ciphered key to replace the previous fixed key. (Otherwise there is no effect.)
Fixes/releases the scrambling key or allows an update to the last deciphered key.	
PINKEY value	
value:	Decimal value of PIN code, between 0 and 16,777,215 .
Sets the PIN scrambling key value. Omitting the parameter reveals the current setting.	
SETPID input PID [priority]	
input:	Input data stream: either CP (for COMPEL), CA , or AUX (for Aux data).
PID:	Selects the PID (in <i>hex!</i>) for the Transport packets carrying the desired data stream. Must be 20 to 1FFE inclusive.
priority:	Either L (for Latency time) or B (for Bandwidth). If omitted alone, then the previously assigned (or factory default) value is retained.
Sets the transport packet PID used for injection of the specified input data stream at the priority specified.	
RE state [number]	
state:	O (for Open), C (for Close), or (for contact #1 only) F meaning Follow CA scrambling state.
number:	1 or 2 , indicating the affected user solid-state contact. Both are specified if omitted.
The specified solid-state contact is opened or closed accordingly.	
SETLABEL label	
label:	Unit label. Field entry is truncated at 10 characters.
Sets Unit Label displayed on UMX Home LCD screen (and Terminal Welcome Banners).	

Table 3.8: UMX5010 Network-Enabled Local Control Commands

SCR type [partition]	
type:	Either PIN (for PIN scrambling), 97CA (for legacy 1997 WCI CA), 02CA (for WCI CA with 2002 upgrade), or NONE .
partition:	If the PCA type is selected, partition sets the borderline PID value in hex at and above which all non-NULL transport packets are scrambled. If not supplied, then the previously selected (or factory default) setting is used.
Sets the scrambling type. NOTE: When using 2002 COMPEL/CA , if the KMS stream is disrupted or if the ciphered scrambling seeds fail to reach the UMX 5010 , the unit will turn off scrambling and put the signal "in the clear" at least for the remainder of that odd/even seed distribution period (typically one to two minutes). Using 1997 COMPEL/CA under the same conditions, the UMX 5010 will keep the signal scrambled even with the risk that downstream IRDs will "go dark".	

Local Control Commands Local Control commands that are always functional at the **UMX 5010 Terminal** are listed in **Table 3.9** below. (Command that are allowed only if local control is enabled by the **COMPEL** network are listed above in **Table 3.8**.)

Table 3.9: UMX 5010 Local Terminal Commands

CLRDIAG	
Command clears all the diagnostic log counters for lost transport, lost inputs, buffer overflows, etc.	
H [command]	
command:	Any of the terminal command names (PC , R , PORT , etc.).
If an H or any invalid command beginning with an H is entered and the command parameter is omitted, the whole Help screen will be displayed, consisting of a list of all currently available commands and a brief description of each. If an H or any invalid command beginning with an H is entered and the command parameter is a valid User Command Name , then detailed help for the specified command will be displayed.	
LATCHALARMS x	
x:	Either E for Enable or D for Disable .
Command turns Alarm Latching ON or OFF .	
OH	
On hook. Disables modem access. Modem access is only re-enabled by successful modem password entry.	
PC device baud	
device:	One of MODEM , TERMINAL , AUXDATA , CA , or COMPEL .
baud:	1200 , 2400 , 4800 , 9600 , 19200 or 38400 (or 115200 for AUX DATA only).
parity:	N (none), E (even), or O (odd).
Configures communication parameters for any serial device. See Serial Inputs Setups on page 28 for details.	
PORT device	
device:	Device assigned to the AUX/TERM port, either TERMINAL , MODEM or AUXDATA .
Assigns the given device to the Aux/Term port.	

Table 3.9: UMX 5010 Local Terminal Commands

PW password																	
password:	One to six alphanumeric characters.																
Changes the modem password to the specified password .																	
R type [page]																	
type:	Indicates the type of report as follows: CA Scrambler and conditional access status D Diagnostic data (lost transport lock, lost inputs, buffer overflows) I Indicator Timeout settings NC Network Controller Status R Solid state contact Status SD Serial data input settings SP Serial Port Configuration T Carrier ID Tag Table																
Issues the specified report.																	
RESET																	
Resets unit.																	
SETTIME input time																	
input:	Input data stream: either CP (for COMPEL), CA , or AUX (for Aux Data).																
time:	Timeout value in seconds.																
Sets the Lost-Input IndicatorTimeout in seconds. If the input is not detected for the time seconds, then an indication event is recognized and logged. If the specified type of event is not masked, then an alarm or warning is given.																	
SETUID [id]																	
id:	Unit ID number between 00 and 99 inclusive. 00 is the factory default setting, which also disables terminal daisy-chain capability. If the id parameter is omitted, the command returns the current unit ID setting.																
Used for assigning the Unit ID number for gaining Talker access on a shared serial bus.																	
VER																	
Displays the Welcome banner and the versions of hardware and software components within the UMX, as given below :																	
	<table border="0"> <thead> <tr> <th style="text-align: center;">Code</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td>Application, current</td> <td>###. Application revision</td> </tr> <tr> <td>Application, backup</td> <td>###. Application revision</td> </tr> <tr> <td>Boot Loader</td> <td>V###. Boot Loader revision</td> </tr> <tr> <td>MP PWA</td> <td>Version code: Type and revision</td> </tr> <tr> <td>MP Xilinx</td> <td>Version String for all installed Xilinx FPGA load</td> </tr> <tr> <td>MP Lattice</td> <td>Version String for all installed Lattice CPLD load</td> </tr> <tr> <td>CA secure micro</td> <td>##. Secure micro. {if installed}</td> </tr> </tbody> </table>	Code	Description	Application, current	###. Application revision	Application, backup	###. Application revision	Boot Loader	V###. Boot Loader revision	MP PWA	Version code: Type and revision	MP Xilinx	Version String for all installed Xilinx FPGA load	MP Lattice	Version String for all installed Lattice CPLD load	CA secure micro	##. Secure micro. {if installed}
Code	Description																
Application, current	###. Application revision																
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MP Xilinx	Version String for all installed Xilinx FPGA load																
MP Lattice	Version String for all installed Lattice CPLD load																
CA secure micro	##. Secure micro. {if installed}																

Report Screens
Scrambler and Conditional Access Status Report (Terminal Command: R CA)

This report lists:

1. **Current Scrambler** assignment (**PIN**, **1997 WCI CA**, or **PARTITIONED CA**),
2. **CA Override** status (**CLEAR** or **EXTERNALLY SET**),
3. **PIN** scrambling key,
4. **Fixed Key** status (for **CA**).

Diagnostic Data Report (Terminal Command: R D)

This report lists:

1. **ASI port lock status** (**LOCKED** or **UNLOCKED**) and whether current status was set manually or forced by auto-switch
2. **Number of ASI lost-lock events** on the current ASI port.
3. Time since the **last ASI lost-lock event** occurred (**hhhh:mm:ss** or **N/A** if no events have occurred since last **CLEAR LOG** command).
4. Current **COMPEL Control Stream Status** (**PRESENT** or **NOT PRESENT**).
5. **Number of lost-input events** on the **COMPEL** input stream.
6. Time since the **last COMPEL lost-input event** occurred (**hhhh:mm:ss** or **N/A** if no events have occurred since last **CLEAR LOG** command).
7. Current **CA Stream Status** (**PRESENT** or **NOT PRESENT**).
8. **Number of lost-input events** on the **CA** input stream.
9. Time since the **last CA lost-input event** occurred (**hhhh:mm:ss** or **N/A** if no events have occurred since last **CLEAR LOG** command).
10. Current **Aux Data Stream Status** (**PRESENT** or **NOT PRESENT**).
11. **Number of lost-input events** on the **Aux Data** input stream.
12. Time since the **last Aux Data lost-input event** occurred (**hhhh:mm:ss** or **N/A** if no events have occurred since last **CLEAR LOG** command).
13. Current **Transport Injection Buffer Status** (**OK**, **>75%**, **overflowed in last 5 minutes**)
14. **Number of Transport Injection Buffer Overflows**
15. Time since the **last Transport Injection Buffer Overflow** (**hhhh:mm:ss** or **N/A** if no events have occurred since last **CLEAR LOG** command).
16. **Estimated Transport stream Data Rate** (averaged over 10 seconds).
17. **Transport Stream NULL Packet Bandwidth** (averaged over 10 seconds).
18. **Transport NULL packet % used** (percentage of all **NULL** packets being used).

Indicator Timeout Settings Report (Terminal Command: R I)

This report lists:

1. **Indicator Response Time** for the **COMPEL** stream input, in **hh:mm:ss** format.
2. **Indicator Response Time** for the **CA** stream input, in **hh:mm:ss** format.
3. **Indicator Response Time** for the **AUX Data** stream input, in **hh:mm:ss** format.

Network Control Status (Terminal Command: **R NC**)

This report lists the subset of the following supported in this release:

1. Unit **Serial Number**
2. **Unit Label**
3. **Network Header**
4. **COMPEL Lock Status (LOCKED or UNLOCKED)**
5. **Local Control Enable Status (ENABLE or DISABLE)**
6. **Network Protection Mode (PROTECTD or SHARED)**
7. Time (**hhh:mm:ss**) since last **COMPEL** packet with valid network header received
8. Time (**hhh:mm:ss**) since last **COMPEL** packet with valid header addressed to unit.
9. Total **HISTORY**, the time (**hhh:mm:ss**) elapsed since the unit's last reset.
10. Total no.of **COMPEL** packets processed (incl. **Keep-alives**) since last unit reset.
11. Number of **COMPEL** packets with **Invalid Headers** received.
12. Number of **COMPEL** packets with **Invalid Checksums** received.
13. Number of **COMPEL** packets with **Invalid Lengths** received.
14. Number of **COMPEL** packet processing **Buffer Overflows**.
15. Number of **COMPEL** packets received with **Syntax Errors**.

Solid State Contacts Status (Terminal Command: **R R**)

The report lists all **solid state contacts** by contact number and the state of each (**OPEN**, **CLOSED**, or **FOLLOW CA**).

Serial Data Input Settings (Terminal Command: **R SD**)

For each of the three basic injected streams (**COMPEL**, **CA**, **AUX data**), this report lists the assigned **PID** (in *hex*) and each stream's **Priority** (either **Latency** or **Bandwidth**).

Serial Port Configuration (Terminal Command: **R SP**)

This report lists:

1. The **Device** currently assigned to the **Aux/Term** port (**MODEM**, **TERMINAL**, **AUX-DATA**, **PRINTER**, **NONE**, or **LOCAL COMPEL**).
2. **COMPEL** device setup (**baud rate**, **data-bits**, **parity**, **stop bits**)
3. **CA** device setup (**baud rate**, **data-bits**, **parity**, **stop bits**)
4. **Terminal** device setup (**baud rate**, **data-bits**, **parity**, **stop bits**)
5. **Modem** device setup (**baud rate**, **data-bits**, **parity**, **stop bits**)
6. **Aux Data** device setup (**baud rate**, **data-bits**, **parity**, **stop bits**)

Tag Site Table Report (Terminal Command: **R T**)

This report lists all possible tag sites **00** through **14** with a single parameter field for each that displays a frequency (**xxxxx.xx MHz**) or **NOT ASSIGNED**.

CHAPTER 4 MAINTENANCE AND TROUBLESHOOTING

4.1 Maintenance

Maintenance of the **UMX 5010** is limited to keeping the chassis clean and ensuring that cables remain firmly connected. Occasionally wipe the exterior with a soft, damp cloth to remove any accumulated dust and dirt and check that cables are securely attached.



The **UMX 5010** incorporates security labels over some of the screws. There are no user-serviceable components within the **UMX 5010**. Tampering with the security labels or opening the unit will void your warranty. If you have any questions, contact **Wegener's Customer Service Department** at the address or numbers listed under **Customer Service**.

4.2 Troubleshooting

This section is not intended as an exhaustive list of all possible situations. Please contact us with any problems you cannot resolve independently. (See **Chapter 5 Customer Service** on page 47.)

If you are experiencing any difficulties, first check the LCD and LED indicators on the **UMX5010** to determine if any warnings or alarms are active. See **Table 3.4: UMX 5010 Front Panel LED Indicator Descriptions** on page 12 for descriptions of LED states.

No Functions At All

If the unit is not functioning at all and neither the LCD nor any LEDs are lit, there may be a loss of AC power. Do the following:

- a. Check that AC power cord is firmly connected at both ends.
- b. Check that your AC power source is supplying AC power.
- c. Press the **ENT** button on the front panel.

No Output

If the unit is receiving power and there are no alarm or warning conditions indicated by the front panel, but there is still no output, check your ASI input connections. Also check the operation of your monitoring equipment.

LED Indicators

Use **Table 3.4: UMX 5010 Front Panel LED Indicator Descriptions** on page 12 to help in troubleshooting.

NOTE: Only one alarm or warning condition is displayed at a time on the LCD. When multiple alarm or warning conditions exist, those conditions are displayed in the order of importance. The highest priority condition is displayed first. Further alarms or warnings will be shown after the more critical item(s) is cleared.

NOTE: When using **2002 COMPEL/CA**, if the KMS stream is disrupted or if the ciphered scrambling seeds fail to reach the **UMX 5010**, the unit will turn off scrambling and put the signal "in the clear" at least for the remainder of that odd/even seed distribution period (typically one to two minutes). Using **1997 COMPEL/CA** under the same conditions, the **UMX 5010** will keep the signal scrambled even with the risk that downstream IRDs will "go dark".

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CHAPTER 5 CUSTOMER SERVICE

5.1 Warranty

The following warranty applies to all **Wegener Communications** products including the **UMX 5010 UnityMux**:

All **Wegener Communications** products are warranted against defective materials and workmanship for a period of one year after shipment to customer. **Wegener Communications'** obligation under this warranty is limited to repairing or, at **Wegener Communications'** option, replacing parts, subassemblies, or entire assemblies. **Wegener Communications** shall not be liable for any special, indirect, or consequential damages. This warranty does not cover parts or equipment which have been subject to misuse, negligence, or accident by the customer during use. All shipping costs for warranty repairs will be prepaid by the customer. There are no other warranties, express or implied, except as stated herein.

5.2 Technical Support

If the unit should fail to perform as described, if you need help resolving problems with your **UMX 5010**, or for questions about obtaining service for your **UMX 5010**, contact **Wegener Communications Customer Service** at (770) 814-4057, FAX (678) 624-0294, or e-mail service@wegener.com.

To return a product for service:

- a. Obtain a **Return Material Authorization (RMA)** number by completing and faxing a copy of the **RMA Request Form** to (678) 624-0294. You may e-mail the same information instead to: service@wegener.com.
- b. To help us identify and control returned units, plainly write the RMA number on the outside of the product-shipping container. This will help us return your unit to you as quickly as possible.
- c. Return the product, freight prepaid, to the address below:

Service Department RMA# _____
 Wegener Communications, Inc.
 359 Curie Drive
 Alpharetta, GA 30005

NOTE: All returned material must be shipped freight prepaid. C.O.D. Shipments will not be accepted.

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INDEX

A

- ac power connector 7
- agency approvals 4
- air flow for safe operation 5
- ALARM LED 13
- alarm/warning conditions, display of 45
- alarm/warning relays 3, 8
- alternate main-level screen, conditions for 20
- amperage 3
- anchor screws 6
- angle brackets 6
- application backup screen 37
- application current screen 37
- application s/w switch screen 32
- approvals by agency 4
- arrow buttons 10
- ASI transport input/output 8
- ASI transport screen 19, 32
- async data input 13
- aux data input setup screen 17, 26
- aux data settings screen 18
- aux data stream screen 19, 34
- AUX IN LED 13
- aux/term port 7, 13
- aux/term port device selection screen 18, 28
- auxiliary data async input 3
- auxiliary data channel 2

B

- backup application screen 20, 37
- baud rates 2
- BNC jack 8
- bolts, anchor 6
- boot loader screen 20, 37
- brackets, mounting 6
- buttons, front-panel 10

C

- CA data stream screen 19
- CA IN LED 13
- CA IN port 7
- CA input setup screen 17, 25
- CA override screen 24

- CA scrambler partition PID screen 17, 27
- CA scrambler screen 20, 38
- CA secure microprocessor screen 20, 38
- CA settings screen 18
- CA setup screen 17, 26
- CA stream screen 33
- CA type screen 17, 26
- cables
 - connecting to unit 7
 - routing of 6
- carrier ID tags
 - number of entries 2
 - setup screen 18, 28
- CE certification 4
- changes to manual, suggestions for 1
- chassis
 - description 2
 - dimensions 3
 - earthing 6
 - opening of 6
- circuit overloading 6
- claims of damage 5
- classification by FCC 4
- cleaning the UnityMux 45
- clear logs screen 19, 35
- clearance around unit 5
- commanding the UnityMux 10
- comments or suggestions 1
- COMPEL IN LED 12
- COMPEL input 3
- COMPEL input setup screen 17, 25
- COMPEL port 7
- COMPEL settings screen 18
- COMPEL stream status screen 19, 33
- components, user-serviceable 4, 45
- conditional access setup screen 26
- conditions for alternate default screens 20
- connecting the unit 7
- connection to supply circuit 6
- connectors, rear-panel 7
- contacting Wegener regarding manual 1 1
- control stream. See COMPEL stream
- controlling the UnityMux 10

- controls and indicators 9
- cross supports 6
- current application screen 20, 37
- current of supplied power 3
- current version info screen 2 0, 37

D

- D connector, nine-pin 7
- daisy chaining serial ports 3
- damage claims 5
- data channel, auxiliary 2
- data inject buffer screen 34
- default LCD screens 20
- depth of chassis 3
- description of unit
 - functional 2
 - physical 2
- desktop installation 6
- desktop mounting 5
- difficulties with the UnityMux 45
- dimensions of chassis 3 3
- disable site 18
- display, front-panel 9
- down-arrow button 10
- DVB ASI input/output 2
- DVB ASI ports 8

E

- earthing 6
- edit mode, LCD 9, 11
- edit or disable site 18
- editing parameters 9
- elevated operating ambient 5
- e-mail
 - customer service 47
 - reading 23
 - regarding manual 1
 - viewing messages 9
- email screen 17
- ENCRYPT ON LED 12
- encryption control table screen 17, 27
- enter (ENT) button 10
- environment for mounting 5
- environmental specifications for the UnityMux 4
- equipment earthing 6

equipment power ratings 6
 equipment rack 5, 6
 escape (ESC) button 10
 Ethernet cable, shielding of 5
 Ethernet port 2, 3, 7
 European certification 4
 even key scrambling 12

F

fax number
 customer service 47
 manuals 1
 FCC classification 4
 FCC-mandated emissions suppression 5
 Federal Communications Commission 4
 fixed key encryption screen . . 17, 27
 formatting of serial ports 3
 frequency of supplied power 3
 front brackets 6
 front panel
 illustration 2
 indicators 9
 LEDs 12
 operation from 9
 front-panel display 9
 functional description 2

G

grounding 6

H

handshaking 2
 height of chassis 3
 help screen, navigation 20, 38
 hierarchy, menu screens 17
 home screen 21
 housing 2
 humidity, maximum 4

I

IEC receptacle 7
 illustration
 front panel 9
 front-panel LEDs 12
 pushbuttons 10
 rear panel 7
 indication time variable 12
 indicator descriptions 45

indicator response setup
 screen 18, 30
 indicator screens, software
 download 17
 indicators, UnityMux 9
 info type screen 10
 injected stream setup screen . . 17, 25
 input, DVB ASI 2
 inspecting the UnityMux 5
 installation
 desktop 6
 rack 6
 safety during 4
 UnityMux 5
 interference, radio 5

J

jitter, PCR 2

K

keep-alive packets 12

L

label, unit 9
 labels, security 4, 45
 LCD
 description of 9
 modes of 9
 types of screens 10

LED

ALARM 13
 AUX IN 13
 CA IN 13
 COMPEL IN 12
 ENCRYPT ON 12
 SCR KEYS 12
 TRANSPORT IN 12
 WARNING 12

LED indicators 12, 45
 left-arrow button 10
 light-emitting diodes (LEDs) 12
 liquid-crystal display (LCD) 9
 listing by UL 4
 loading, mechanical 6
 location and mounting 5
 log cleared, time since 3 5
 lugs, grounding 6

M

mailing address
 customer service 47

 manual comments or questions 1
 maintenance 45
 maximum relative humidity 4
 mechanical loading 6
 menu screens
 heirarchy of 17
 type of LCD 10
 misc setups screen 18, 30
 modem devices 39
 modem password screen 30
 modem settings screen 18
 modem, using for remote
 terminal 3
 mounting
 desktop 6
 equipment rack 6
 location and 5
 MP lattice version screen 0, 37
 MP PWA ID screen 20
 MP PWA version screen 37
 MP Xilinx version screen 20, 37
 MPEG transport streams
 packet size of 2
 supported 2
 multi-unit rack assembly 5

N

navigation help screen 20, 38
 navigation of screens 10
 network control status screen . . 19, 35
 networking applications,
 upgrading for 2
 no output from unit 45
 no unit functions 45

O

odd key scrambling 12
 opening the chassis 4
 operating ambient temperature 5
 operating temperature 4
 operation of UnityMux 9
 output, DVB ASI
 output, problems with 45
 overcurrent protection 6
 overloaded circuits 6
 overview of UnityMux 2

P

packet size of transport stream 2
 packing materials 5

parameter screen LCD type	10	reliable earthing	6	modem password 30
parameters, editing	9	remote terminal via modem 3		MP lattice version
parity setting	3	reset unit screen	18, 32	MP PWA version
partition scrambling enable screen	17, 26	return for repair	5	MP Xilinx version
PCR jitter	2	RF emissions	5	navigation help
phone number, customer service	47	right-arrow button	10	network control status
physical description of UnityMux	2	RJ45 Ethernet port	3, 7	partition scrambling enable
PIN scrambling key screen	17, 27	RMA number	47	PIN scrambling key
PIN scrambling LED. See SCR KEYS LED		routine operations	9	printer email
pinouts, connector	7–8	routing cables	6	reset unit
polarity of alarm/warning relays	3	RS232 serial ports pinouts of	7–8	serial data injection buffer
port number, display of	9	specifications of	2	serial device setup
port specifications Ethernet	3	S		serial inputs setups
RS232 serial	2	safety	4	serial port devices
power rating of equipment	6	SCR KEYS LED	12	software download
power specifications	3	scrambling keys LED	12	software switch
power strips, use of	6	scrambling payload data	12	solid-state closure setup
precautions for safety	4	screen application backup	37	time since log cleared
printer email screen	30	application current	37	transport input setup
printer settings screen	18	application s/w switch	32	transport stream status
problems with the UnityMux	45	ASI transport	32	unit ID
pushbuttons description of	10	aux data input setup	17, 26	unit label
functions of	11	aux data stream	34	unit s/w switch to backup
illustration of	10	aux/term port device selection	28	unit status
location of	2	boot loader	37	user contact closure
Q		CA input setup	17, 25	warning/alarm
questions about safety	4	CA override	24	screen types, LCD
R		CA scrambler	38	screen, unit ID
rack earthing of	6	CA scrambler partition PID	27	screws, anchor
mounting in	6	CA secure microprocessor	38	security labels
spacing in	5	CA setup	17, 26	selectable service
total loading of	6	CA stream	33	serial data injection buffer screen
rack assembly, temperature of	5	CA type	26	screen
radiated emissions, suppressing	5	carrier ID tags setup	18, 28	serial device settings
radio interference	5	clear logs	35	serial device setup screen
reading e-mail 23		COMPEL input setup	17, 25	serial inputs setups screen
rear-panel connections	7	COMPEL stream status 33		serial number
reduced air flow	5	conditional access setup	26	serial port devices screen
relative humidity	4	current application	37	serial ports, specifications of
relays connector	8	current version info	20, 37	service department
relays, alarm/warning	3	data inject buffer	34	service, selectable
		default	20	setting up the UnityMux
		email	17	shipping container
		encryption control table	27	shipping the UnityMux
		fixed key encryption	27	side vents
		home	20, 21	site edit or disable
		indicator	17	size of chassis
		indicator response setup	30	software download screen
		injected stream setup	17, 25	software switch screen
		misc setups	18, 30	solid-state closure setup screen
				screen
				spacing the unit in rack

specifications, UMX5010	2	transport input setup screen . . .	17, 24	unpacking and inspection	5
start bit	3	transport rates	2	up-arrow button	10
status information	12	transport stream packet size	2	upgrading for networking applications	2
stop bit	3	transport stream status screen	19, 35	user contact closure pinouts	8
storage temperature	4	troubleshooting	45	screen	18, 31
streams, MPEG transport	2	types of LCD screens	10	specifications	3
suggestions or comments	1			user-serviceable components . . .	4, 45
supply circuit, connection to	6				
suppressing emissions	5				
T					
tags (carrier IDs)	2	UL listing	4	V	
tampering	4	Underwriter Laboratories	4	ventilation of unit	5
temperature, ambient operating	5	uneven mechanical loading	6	version info	37
temperatures, operating and storage 4		unit connections	7	view mode, LCD	9, 11
terminal monitoring and control	3	unit description functional	2	voiding warranty	4, 5
terminal/modem mode	39	physical	2	voltage of supplied power	3
text messages	9	unit ID screen	18, 29		
time since log cleared screen	19, 35	unit label	9	W	
TMRA	5	unit label screen	18, 30	WARNING LED	12
total rack loading	6	unit not functioning	45	warning relays	8
TRANSPORT IN LED 1	2	unit s/w switch to backup screen . . .	18	warning/alarm screen	17, 22
		unit status	12	warranty, voiding 4	5
		unit status screen	19, 32	width of chassis	3