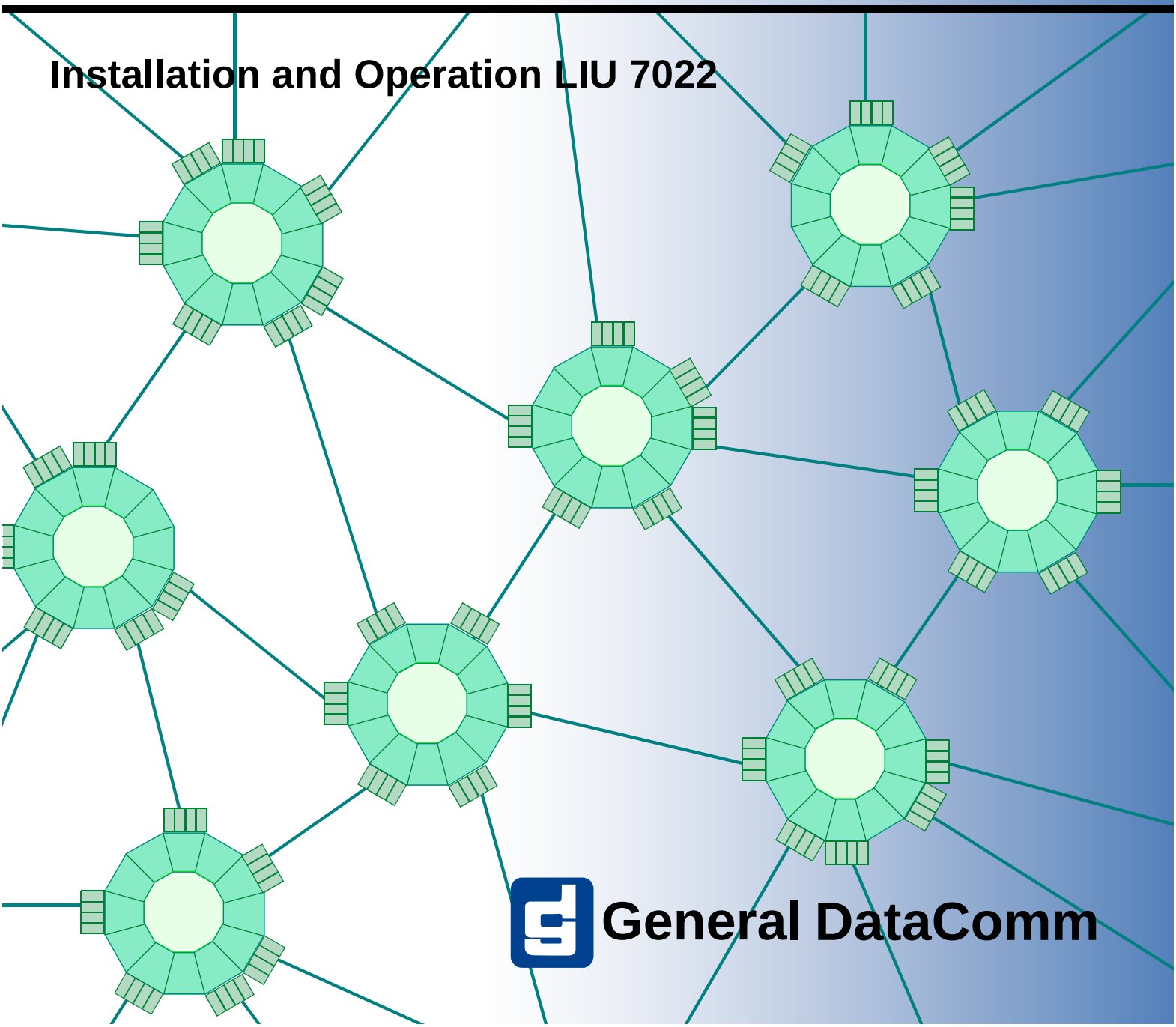
087R714-000
Issue 01

UAS 7000

Installation and Operation LIU 7022



General DataComm

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Revision History

Table-1 Revision History

Issue Number	Date	Description of Change
01	Mar. ’99	First issue.

Safety Guidelines

- Always use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:
- Always use caution and common sense.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Repairs must be performed by qualified service personnel only.
- Never install telephone jacks in a wet location unless the jack is designed for that location.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.

- Use caution when installing telephone lines and never install telephone wiring during an electrical storm.

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component.

The equipment may contain static-sensitive devices that are easily damaged and proper handling and grounding is essential. Use ESD precautionary measures when installing parts or cards and keep the parts and cards in antistatic packaging when not in use. If possible, use antistatic floorpads and workbench pads.

When handling components, or when setting switch options, always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, like a screwdriver or a paper clip, to set switches.

FCC Part 68 Compliance

Connection of data communications equipment to the public telephone network is regulated by FCC Rules and Regulations. This equipment complies with Part 68 of these regulations which require all of the following.

For single or multi-line equipment that connects to the telephone network via a plug and jack, the plug and jack must comply with the FCC Part 68 rules. This device is designed to be connected to the telephone or premises wiring, using a compatible modular jack which is Part 68 compliant. See installation chapter for details.

If the unit causes harm to the telephone network, the telephone company may discontinue your service temporarily and if possible, you will be notified in advance. If advance notice is not practical, you will be notified as soon as possible and will be advised of your right to file a complaint with the FCC. The telephone company may change its communication facilities, equipment, operations and procedures where reasonably required for operation. If so, the telephone company will notify you in writing. All repairs or modifications to the equipment must be performed by General DataComm. Any other repair or modification by a user voids the FCC registration and the warranty.

To connect the LIU 7022 to the public telephone network the customer is required to provide the following information:

FCC Registration Number:

Telephone Company jack type:

Facility Interface Codes:
T1 Interface -

Service Order Code:
T1 Interface -

Industry Canada Notification

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operation and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Electromagnetic Compatibility

This Class A digital apparatus complies with Canadian ICES-003.

Avis D'industrie Canada

L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la comformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

Avis: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

La Compatibilité d' Eléctro-magnetique

Cet appareil numerique de la classe A est conforme a la norme NMB-003 du Canada.

Deutschland

Installations Anweisungen: Installieren Sie die Telefonleitungen nicht während eines Gewitters. Installieren Sie die Telefonleitungen nicht in einem feuchten Raum, auβer die Dose entspricht den Vorschriften für Feuchträume. Berühren Sie unisolierte Telefonleitungen oder Einrichtungen nicht, auβer diese sind vom Telefonnetz getrennt. Vorsicht bei der Installierung oder Änderung von Telefonleitungen. *Achtung:* Es gibt keine durch den Benutzer zu wartende Teile im Gerät. Wartung darf nur durch qualifiziertes Personal erfolgen.

EC Declaration of Conformity

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On behalf of: General DataComm Inc.
1579 Straits Turnpike
Middlebury, CT 06762-1299, U.S.A.

The products to which this declaration relates are in conformity with the following relevant harmonized standards, the reference numbers of which have been published in the Official Journal of the European Communities;

Electromagnetic Compatibility

EN55022: 1994

Specification for limits and methods of measurement of radio interference characteristics of information technology equipment.

EN 50082-1: 1992

Generic immunity standard Part 1 Residential, Commercial, and Light Industry.

Safety

EN 60950: 1995 A1 through A3

Low Voltage Directive relating to electrical equipment designed for use within certain voltage limits

Service Support and Training

VITAL Network Services, a General DataComm company, is committed to providing the service support and training needed to install, manage, and maintain your GDC equipment.
GDC's VITAL Network Services provides hands-on training courses through **VITAL Network Services Global Technology Training Services**. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems. Training courses are available at our centers in the US, UK, France, Singapore and Mexico, as well as at a customer's site.
For more information regarding GDC's VITAL Network Services' service programs, training courses, or for assistance with your support requirements, contact GDC's VITAL Network Services at the address or phone number listed below, or visit our website at: http//www.vitalnetsvc.com**VITAL Network Services World Headquarters**
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International Calling Code (+)

When calling from outside the country of origin, use the appropriate International Calling Code where the + symbol is shown.

Table of Contents

UAS LIU 7022

The UAS LIU (Line Interface Unit) 7022 provides a connection to E1 networks. It is used as the network interface to the shelf backplane. Each 7022 supports two E1 lines. The LIU 7022 is a single slot card that may be installed in single or multiple shelves or enclosures. Each of the E1 interfaces supports Basic or CRC-4 multiframe, with HDB3 line coding. See Figure 1.

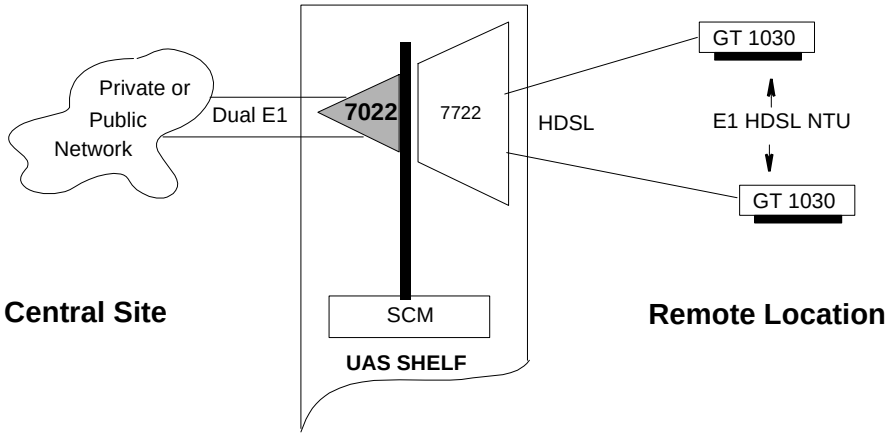


Figure 1 LIU 7022 - Data Traffic

The LIU 7022 is fully network managed by the UAS shelf resident GDC SpectraComm Manager (SCM) Card, and an associated SNMP manager or MIB Browser.

Other features are:

- Can be mixed or matched with other UAS/SpectraComm data sets in the same shelf.

A 7001 (T1) cannot reside in the same shelf.

- Supports concentrator for central termination function.
- Full E1s can be terminated in a single shelf; up to four LIUs may be supported in a single or dual shelf.
- Multiplexes Drop-Side Interface Units (DIUs) like the 7722, 7616, and 7626 via the shelf backplane.

Installing the LIU 7022

There are two hard options on the basecard; impedance jumpers and an override jumper (See Figure 2). Select the desired settings, then install the LIU 7022 card in the UAS Shelf following the directions below. Then proceed to cable, power-up and set Soft Optioning (Refer to Table 2 and Table 3 - "Software Configuration Options").

1. Insert the card into its slot with the GDC logo on top, then slide it in until it makes contact with the rear panel connectors.
2. Pull down the insertion/extraction tab on the front panel and firmly push the card in until it seats in the rear connectors.

To remove a card, pull down the insertion/extraction tab to unseat the card, then use tab to remove card.

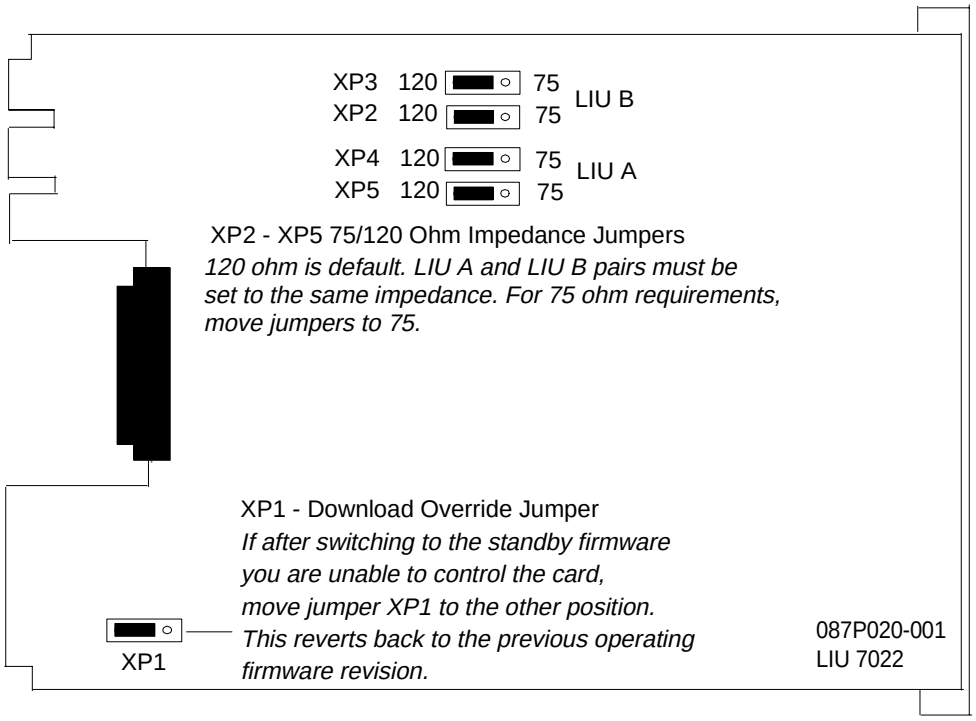


Figure 2 LIU 7022

Cabling and Powering-Up

Figure 3 shows the cabling of a typical network installation.

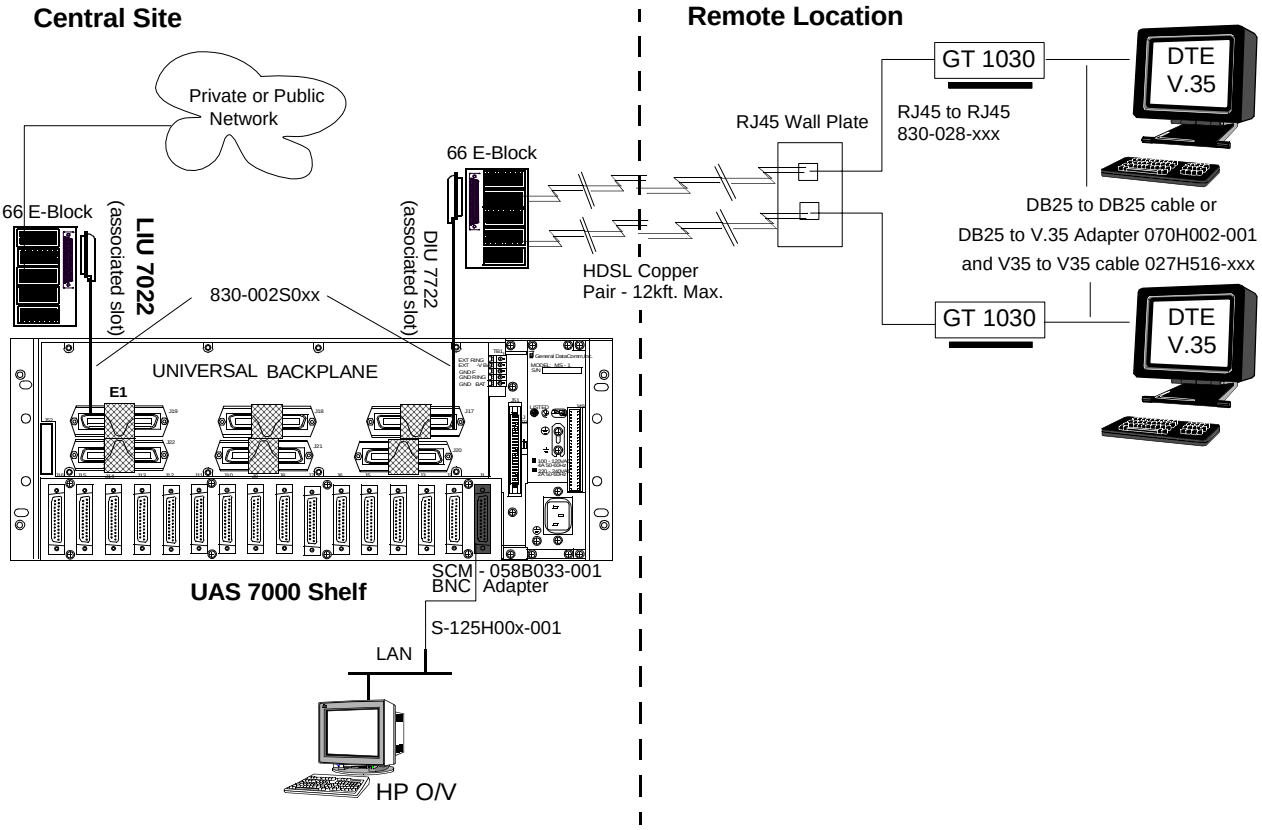


Figure 3 LIU 7022 Application

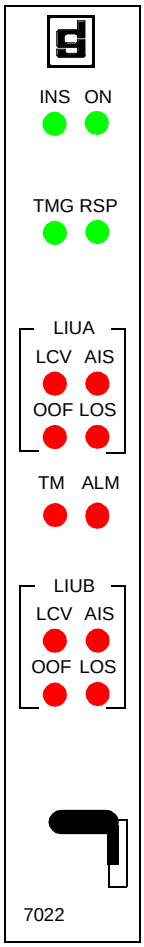
After cabling you can proceed with power-up. Once you insert the LIU 7022 into a powered system (or when you first power the system up), the card will automatically perform a simple Power-On Self-Test (POST). This test allows you to check the front panel LEDs (refer to “Front Panel Indicators”) by turning them ON and OFF in unison for approximately 2 seconds; and it checks the card’s RAM. If the RAM check fails, the ALM LED flashes continuously and all the other LED’s remain OFF. The status is also reported in the Status column of the Manager’s Monitor, Diagnostic, and Configuration screens.

Front Panel Indicators

Table 1 describes the front panel indicators.

Table 1 Front Panel Indicators

Indicators	
LED	**Use**
General	
INS	In Service. Green - constant = Basecard in service.
ON	Power ON. Green - power is applied
TMG	Timing. Green - Lights when supplying 8k timing source to shelf.
RSP	Response. Green - Lights upon transmission of a backplane NMS command.
Network	
LCV LIU A/B	Line Code Violation. Red - Lights upon reception of line code violation in the received E1 data.
AIS LIU A/B	Alarm Indication Signal. Red - Lights upon the reception of a defect condition from the received E1 signal.
LOS LIU A/B	Loss of Signal. Red - Lights upon absence of an E1 signal. (May flicker on LOS condition.)
OOF LIU A/B	Out of Frame. Red - Lights upon detection of loss of selected E1 framing. (May flicker on LOS condition.)
Status	
TM	Test Mode. Red - Lights when unit is undergoing a diagnostic test.
ALM	Alarm. Red - Lights when any alarm threshold is exceeded.



Software Configuration Options

There are no hard options on the basecard. An outline of the LIU 7022 card is shown in Figure 2.

The LIU 7022 is managed through SNMP or Telnet, and all management functions can be controlled from the SCM Card. Table 2 and Table 3 lists the LIU 7022 configuration options that can be set by means of an SNMP network manager such as GDC's TEAM 7000 for UNIX or by UAS 7000 Local Management.

Complete instructions for using other control and maintenance tools can be found in *TEAM 7000 for UNIX* (GDC Part No. 087R705-V300-01) and UAS 7000 Local Management Operations Manual (GDC Part No. 087R706-000-02).

Table 2 Configuration Options Selectable from the TEAM 7000 for UNIX Network Manager

Unit Options	
Interface Type	Network-Side or **Not Assigned** (Not in Service)
Framing	**CAS with CRC4 - Channel Associated signaling with CRC4** CAS without CRC4 - Channel Associated signaling without CRC4 CCS with CRC4 - Common Channel signaling with CRC4 CCS without CRC4 - Common Channel signaling without CRC4
Receiver Range	**Short (6 dB)** or Long (36 dB)
TX Clock Source	**System** - timing is derived from the backplane of the shelf. Recovered (slave) - timing from the Network E1 Internal - this unit is locally generating the clock source
Fallback Clock Src	System - timing is derived from the backplane of the shelf. Recovered (slave) - timing from the Network E1 **Internal** - this unit is locally generating the clock source
Time Slot 16 Contents	**Idle** - If Framing is CAS, then TimeSlot 16 contains Idle. Marks - If Framing is CCS, then TimeSlot 16 contains either Marks or Data. Data - If Framing is CCS, then TimeSlot 16 contains either Data or Marks.
Action Buttons	
OK	Holds edits and dismisses the screen.
Reset	Undoes pending edits since last `File->Save to Unit` operation.
Cancel	Same as Reset and dismisses the screen.
Note: Defaults are in bold.	

Table 3 Configuration Options Selectable from Local Management

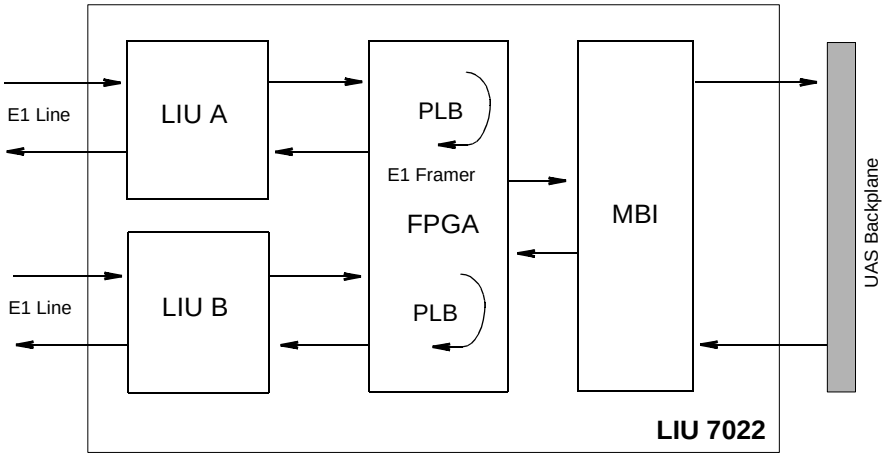
Option	Potential Settings
[0] Return to Main Menu	Returns you to the UAS 7022 Main Menu.
[1] Framing Mode	CCS w/ CRC4, CCS w/o CRC4, CAS w/CRC4, CAS w/o CRC4
[2] Time Slot 16 Contents	MARKS, DATA, Idle
[3] Transmit Clock Source	Recovered - 7022 uses timing recovered from the network receive E1 data as the send timing source for E1 data output to the network (Default) Internal - 7022 serves as the timing source for E1 data output to the network System - 7022 uses timing supplied by the shelf back plane as the timing source for E1 data output to the network.
[4] Fallback Clock Source	Internal - 7022 serves as the send timing source for T1 data output to the network if the configured Transmit Clock Source is unavailable (Default) Recovered - 7022 uses recovered timing if the configured Transmit Clock Source is unavailable. System - 7022 uses system timing if the configured Transmit Clock Source is unavailable.
[5] Line Interface Type:	LINE SIDE, Not Assigned
LIU Selected	LIUA, LIUB
Line Coding	HDB3
[6] Rcvr Range	SHORT HAUL, LONG HAUL
[CR] Return to Previous Menu	Returns you to the UAS 7022 Configuration menu screen.
[S] Save	Save settings

Tests

The LIU 7022 performs the following diagnostic loopback:

- E1 Payload Loopback (PLB) - Loops the recovered E1 receive and transmit paths back towards the E1 network. (FAS [Frame Alignment Sequence] and NFAS [Non-Frame Alignment Sequence] are generated in E1 Framer)

You may initiate these tests using UAS or TEAM 7000 network management. See Figure 4 and Figure 5.



	Test	Source	Self-Test	Configuration
PLB	E1 Payload Loopback	UAS	------	Network

Notes:
MBI = Multiplex Bus Interface - GDC LSI that interfaces to the backplane.
FPGA = Field Programmable Gate Array chip.

Figure 4 LIU 7022 Loopbacks

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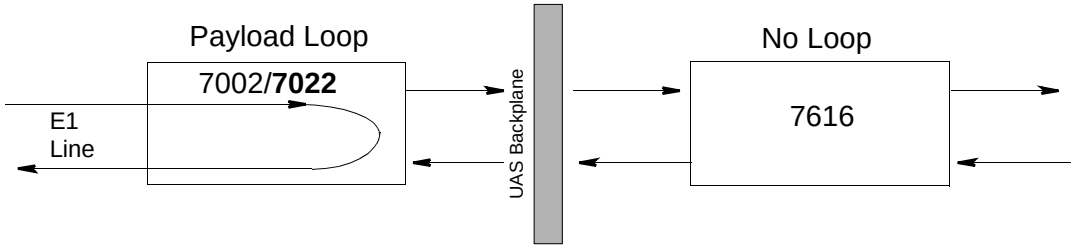


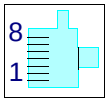
Figure 5 E1 Payload Loopback

Connector Pin Mapping

Table 4 describes the RJ48 C/X pinouts for the LIU 7022 Table 5 describes the 50-pin mapping for the LIU 7022

Table 4 RJ48 C/X (Top and Bottom Row) Pinout

P/N	Function
1	Ring Xmit
2	Tip Xmit
3	
4	Ring Rcv
5	Tip Rcv
6	
7	
8	



RJ48 C/X Jack

Table 5 50-Pin Telco Mapping

Rear Panel 50-Pin Connectors	Slot No.	LIU A Xmt Tip	LIU A Xmt Ring	LIU A Rcv Tip	LIU A Rcv Ring
J17	1	28	3	26	1
	2	32	7	30	5
	3	36	11	34	9
	4	40	15	38	13
	5	44	19	42	17
	6	48	23	46	21
J18	7	28	3	26	1
	8	32	7	30	5
	9	36	11	34	9
	10	40	15	38	13
	11	44	19	42	17
	12	43	23	46	21
J19	13	28	3	26	1
	14	32	7	30	5
	15	36	11	34	9
	16	40	15	38	13
		LIU B Xmt Tip	**LIU B Xmt Ring**	**LIU B Rcv Tip**	**LIU B Rcv Ring**
J20	1	28	3	26	1
	2	32	7	30	5
	3	36	11	34	9
	4	40	15	38	13
	5	44	19	42	17
	6	48	23	46	21
J21	7	28	3	26	1
	8	32	7	30	5
	9	36	11	34	9
	10	40	15	38	13
	11	44	19	42	17
	12	43	23	46	21
J22	13	28	3	26	1
	14	32	7	30	5
	15	36	11	34	9
	16	40	15	38	13

Parts List and Specifications

The specifications and parts for the LIU 7022 are found in Table 6

Table 6 Parts List and Specifications

Parts List	
087P020-001	LIU 7022 Card
209-044-001	RJ48C to Dual 75 ohm unbalanced E1 BNC Connector
Specifications	
Dimensions Height Width Depth Weight	 7.0 in. (178 mm) .81 in. (27 mm) 9.5 in. (241 mm) 1.9 lbs. (0.85 kg)
Power	+ 5 Vdc at 2A (max.) +12 Vdc at 50 mA (max.) -12 Vdc at 50 mA (max.)
Load Number	1.0
Network Management Protocol	SNMP and Telnet
Ambient Temperature operating non-operating	 0 to 50° C -40 to 85° C
Humidity (operating)	5% to 95% (non condensation)
Altitude operating non-operating	 0 to 10,000 feet 0 to 40,000 feet
Rate	2048 kbps
Framing	E1 Framed G.704
Interface	2048 kbps per G.703 and G.704 (-6.0 dB receiving sensitivity)
Impedance	120 ohm twisted pair (Balanced)
Operating Mode	Four-Wire full-duplex.
Data Format	Synchronous, serial binary.
Line Coding	HDB3.
Line Requirements	4-wire, non-loaded metallic circuit.
Receiver Range	Short = 6dB loss, Long = 36dB loss.

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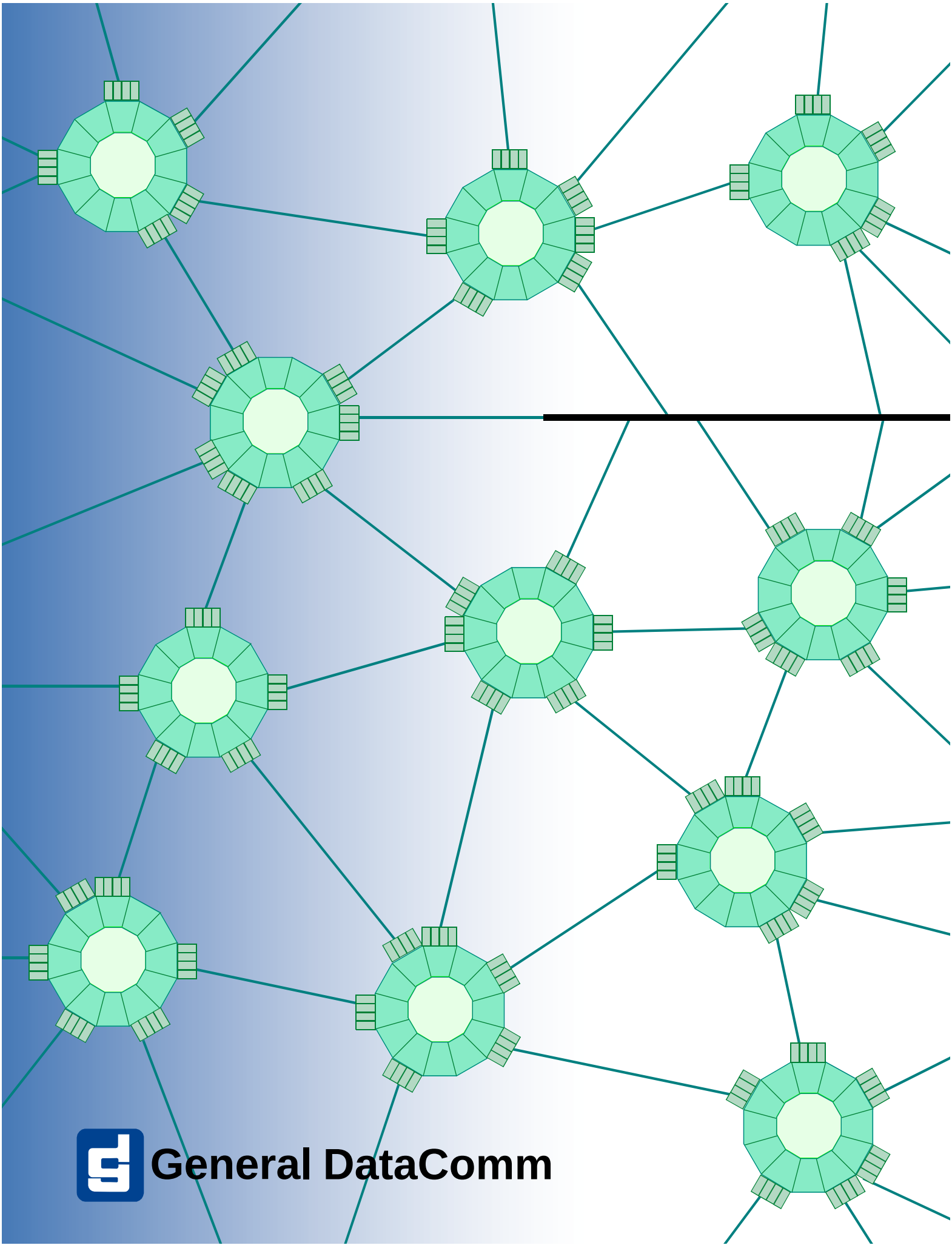
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