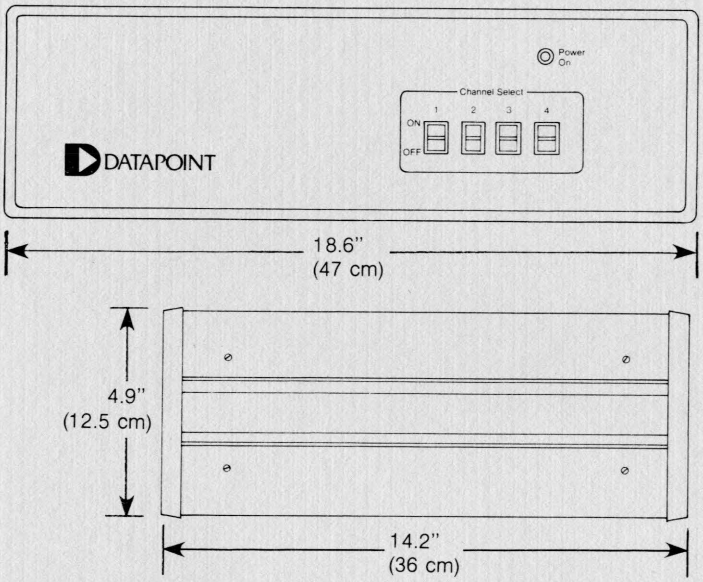
DATAPOINT

Hardware Interface Module

9171



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1.0 GENERAL DESCRIPTION

The 9171 Hardware Interface Module (HIM) forms the interface between the Datapoint International Telex Management System (ITMS) and the telex network. The Hardware Interface Module character, speed, and electrical translation from an ITMS environment to a range of telex network environments. ITMS provides complete telex message creation, sending, and receiving capabilities. The 9171 Hardware Interface Module carries out all the telec network and line control functions in compliance with public telephone and telegraph regulations.

The Datapoint International Telex Management System handles messages to be sent and received, automatically queuing those to be sent by priority and time for unattended delivery. Datapoint workstations can perform message handling functions operating as normal telex machines, or they can be used as DATASHARE terminals for other applications. Conversely, any remote telex terminal can be used for remote, interactive access to the ITMS.

The Hardware Interface Module can be configured for reception and transmission of data on public telex and standard RS 232C or V24 lines. It can also be configured for domestic or foreign telex networks for which it has been approved by the appropriate public telephone and telegraph agency. The character conversion is from ASCII to BAUDOT, either CCITT no. 2 or no. 5. The speed conversion is from 1200 baud to a telex line speed ranging from 50 to 300 baud.

The Hardware Interface Module is equipped with an 8080 microprocessor (socket mounted). Microprograms and fixed data are held in erasable programmable read only memory (EPROM) with a capacity upgradable from 8K to 64K of memory. Transient data are held in static random access memory (RAM) with a maximum capacity of 8K bytes. When operating in the current-loop mode, electrical isolation between the 9171 and the line is provided by means of optocouplers.

2.0

SYSTEM REQUIREMENTS

The HIM is connected directly to the Datapoint processor via a Multiple Port Communications Adaptor (MPCA) and to the switched telex network by any of the following types of lines:

- switched telex network
  - neutral current, 10 mA, 20 mA
  - polar current 40 mA, 60 mA
- serial CCITT V11 (S16) autodial
  - parallel (XD) autodial line
- RS 232C (CCITT V24)

The necessary character translation, ASCII to BAUDOT (CCITT), and speed conversion, from a maximum of 1200 baud to the actual line speed (50 to 300 baud), is performed based on the configuration and option settings in the hardware interface.

Each Hardware Interface Module supports up to four telex lines, each of which can be programmed for Type A, B or XD signalling by means of programming plugs. The interface is capable of 2 or 4 wire connection (current loop), XD (V28 levels) and X20 (V24/28) operation.

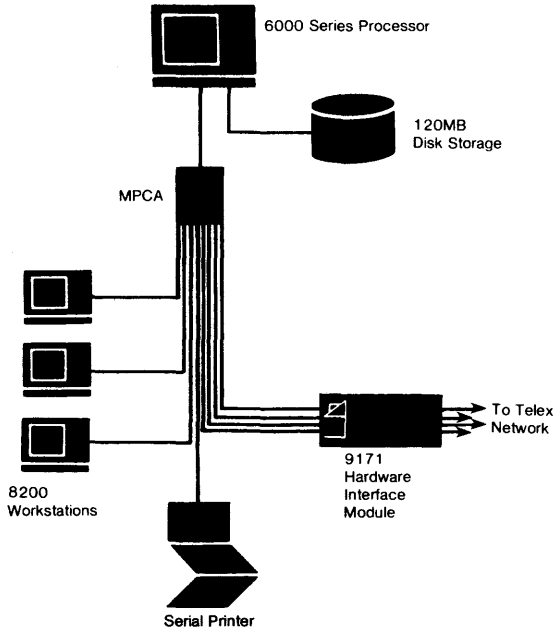


Figure 2-1: Typical ITMS Configuration

3.0

TECHNICAL DESCRIPTION

3.1

Technical Specification

Distortion on received signal: < 40%
Distortion on transmitted signal: < 5%
Telex voltages: +/- 48V, +/- 60V, 120V, +/- 25% adjustable
Line current: 15 mA, 20 mA, 40 mA, +/- 25% adjustable
Codes: CCITT no. 2, CCITT no. 5
Transfer rate: 50 to 300 baud
Number of telex lines: 4 per HIM

3.2

Operator Controls and Indicators

The 9171 has the following controls and indicators accessible to the operator:

Power Switch

The Power Switch is a two position toggle switch located on the rear panel of the Hardware Interface Module. Push the switch up to apply power to the 9171. Push the switch down to turn off power to the unit.

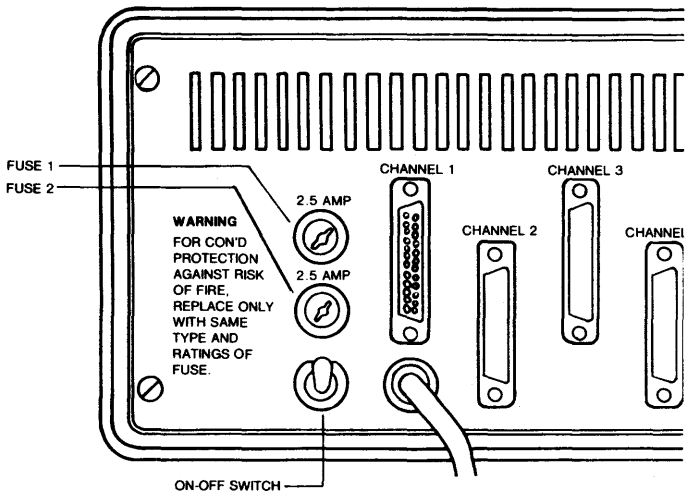


Figure 3-1: Operator Controls (rear panel)

Power On Indicator

The Power On indicator light, located on the front of the unit, is illuminated when the unit is receiving power.

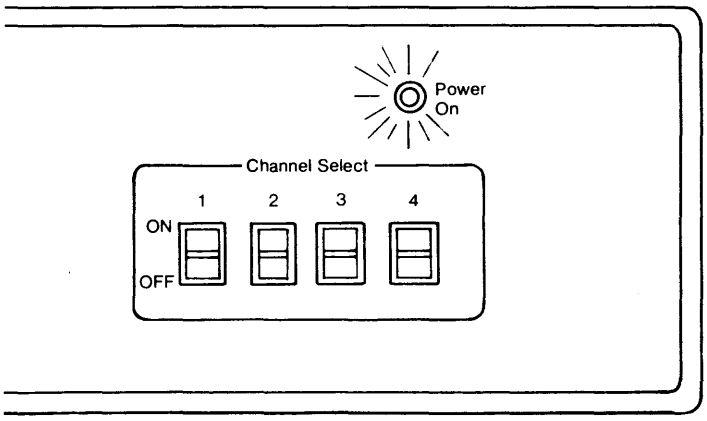


Figure 3-2: Operator Controls (front panel)

Channel Switches

The four Channel Switches on the 9171 are located on the front of the unit. There is one switch for each telex line connected to the unit. These switches are used to signal channel availability to the MPCA by selecting the state of Data Terminal Ready (DTR).

3.3

9171 Communication Message Format

The 9171 and the Datapoint system communicate commands, status, and data via a single serial port per telex line. For each transmission by the Datapoint processor to the 9171, the interface responds with one of the following answers:

Acknowledge
Rejection
Time Out
Status
Data from the telex network

3.3.1

9171 Command Format

Command Format:
SYN DLE 'XX' 'Y1 . . . YN'

where 'XX' is the command number and 'Y1 . . . YN' are the parameters.

Datapoint to 9171 command formats are listed in Figure 3-3.

Command Number	Parameters	Function
01	Y1 : connection type = 'TX' switched network Y2 : transmission speed = XXX in bauds (010, 075, 200, 300)	Physical Initialization
02	Y1 : protocol type = 1 switched network = 2 reserved = 3 special protocol Y2 : connection type = 1 single current = 2 double current = 3 V24 Y3 : country specification = 1 Y4 : code used on Telex line = 1 CCITT no.2 (BAUDOT) = 2 CCITT no.5 (ASCII) Y5 : clear line duration = XXX /10 seconds	Protocol Initialization
03	Y1 : interface configuration = 1 ready to work = 0 not ready Y2 : external call inhibition = 0 external call inhibited = 1 external call allowed Y3 : Telex reception inhibition = 0 reception inhibited = 1 reception allowed	Operating Mode Initialization
04	Y1 : international call = 0 national call = 1 international Y2 : call type = 0 one step = 1 two steps Y3 : time out type = 0 short time out = 1 long time out	Call Request
05	No Parameters	Answer Back Transmission Request
06	No Parameters	Line Clear Request
07	No Parameters	Status Request
08	No Parameters	Data from the Telex Network Acceptance
09	'Character String' = Answer Back	Answer Back Initialization
11	No Parameters WRU = Who Are You (Demand for the subscriber answer back)	WRU Transmission Request
12	No Parameters	Continue Calling Procedure

Figure 3-3: Datapoint to 9171 Command List

9171 Commands

Data to Transmit

SYN 'Data to Transmit' DLE CR

Acknowledgement

p A 'XX' CR

where 'XX' is the number of the command which has been successfully executed (XX = 00 for data).

Rejection

p B 'XX' CR

where 'XX' is the number of the command which has been refused (XX = 00 for data).

Time Out Indication

p T [M] CR

where [M] is only used for DCE3.

Status

p N CR

where N is one of the status codes listed below:

Status	Code Description
0	Normal
1	External Line Clear
2	Transmission Error Between Processor and 9171
3	Out of Phase Command
4	Computer Line Clear Provoked by Computer
5	Call Not Allowed
6	A Character from the Telex Line has been rejected
7	Interface Line Clear
8	DCE3 Unit Power Failure (DCE3)
9	No WRU received after External Call (DCE3)
10	Reception Character Time Out (DCE3)
11	Outgoing Clear default (DCE3)

Figure 3-4: 9171 Status Codes

Data Received Format

' Data Received ' CR

Special Warnings

p G CR

an incoming call is in progress

p J CR

the Hardware Interface Module is not initialized

3.4

Telex Interface Board Programming

Due to the various electrical and protocol environments that can be served by the telex interface board within the Hardware Interface Module, the board must be configured via a programming plug for each application. The following define the configurations that the 9171 can support:

3.4.1

Two Wire — Half Duplex

Pin	to	Pin	Description
6a		3a	Current Loop
5a		3c	Current Loop
4c		1c	Current Loop
2a		4a	Current Loop
5c		8a	TW39, Germany only
20c		20a	Current to TTL Converter
19a		31c	Current to TTL Converter
15c		18a	DSR Indicator
14a		31a	Call Control
14c		32c	Clear Control
11a		30a	Current Loop safe—power fail
9c		1c	Current Loop safe—power fail
11c		9a	Current Loop safe—power fail

3.4.2

Four Wire - Full Duplex

Pin	to	Pin	Description
6a		3c	Current Loop
4c		3a	Current Loop
2c		5a	Current Loop **
7c		10c	Current Loop *
9a		31C	Open Line Inhibit
19c		20a	Current to TTL Converter
20c		18a	DSR Indicator
15c		7a	Current Loop
14a		31a	Call Control
16a		29c	Call Control
14c		32c	Clear Control
15c		32a	Clear Control
18c		11a	Filter Control *
17c		10a	Filter Control *
17a		11c	Filter Control *
17c		17a	Connected if 27a high *

* The Netherlands only
**Not to be wired for the Netherlands

3.4.3

Four Wire - XD

Pin	to	Pin	Description
20c		30c	RS 232C to TTL Converter
19a		29a	RS 232C Line Status Control
19c		31c	Open Line Inhibit
15c		18a	DSR Indicator
14a		31a	Call Control
16a		29c	Call Control
14c		32c	Clear Control
16c		32a	Clear Control
20c		13c	Monitor Receive *
6c		13a	Monitor Transmit *

* Only for Germany

3.4.4

DCE3 For United Kingdom

Pin	to	Pin	Description
20c		30c	RS 232C to TTL Converter
15c		15a	DSR Signal Line
14c		13c	Call Signal Line
14a		13a	Clear Signal Line
29a		31c	
18c		11a	
11c		21c	
5c		21a	
18c		16a	
30a		9c	

3.4.5

Two Wire - Half Duplex (Switzerland) TW55

Pin	to	Pin	Description
6a		3a	Current Loop
5a		3c	Current Loop
4c		1c	Current Loop
2a		4a	Current Loop
20c		20a	Current to TTL Converter
19a		31c	Current to TTL Converter
15c		18a	DSR Indicator
14a		31a	Call Control
14c		32c	Clear Control
11a		30a	Current Loop safe—power fail
9c		1c	Current Loop safe—power fail
11c		9a	Current Loop safe—power fail
100 ohms			
3c_ _^^^^_ 4c			100 ohm, 0.3 watt resistor for recognition of 7.0 mA idle current

3.4.6

United States - Western Union Telex Line Adaptor

Pin	to	Pin	Description
19a		29a	Line Status Control
31c		29a	Line Status Control
18a		15c	DSR Indicator
14a		31a	Call Control
16a		29c	Call Control
14c		32c	Clear Control
32a		16c	Clear Control

4.0

PHYSICAL DESCRIPTION

Width:	*18.5 inches (47 cm)*
Height:	*4.9 inches (12.5 cm)*
Depth:	*14.2 inches (36 cm)*
Weight:	*39.6 pounds (18 kg)*

5.0

ENVIRONMENTAL REQUIREMENTS

Temperature:	50 — 100° F (10 — 38° C)
Humidity:	20 — 90% non-condensing
Heat Dissipation:	682 Btu/hr.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J or Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

6.0

INTERFACE REQUIREMENTS

6.1

Power Requirements

Primary power for the Hardware Interface Module can be 110 V, 130 V, 220 V or 240 V; 50 or 60 hertz +/-1%; 200 watts. Current required is 2 amps at 110 V.

6.2

9171 to MPCA Interface

The 9171 communicates with the Datapoint processor (5500 series compatible) via the MPCA. One MPCA port per telex channel is needed. Each port dedicated to a telex line is configured as a standard DATASHARE port. Commands, status, and data are transferred via the serial interface in the form of ASCII characters. The transfer rate between the 9171 and the MPCA is 1200 baud. The HIM connection with the MPCA is by standard 25 pin connectors, CCITT V24 (EIA STD RS 232C). The cable between the MPCA and the 9171 must be less than 33 feet (10 meters).

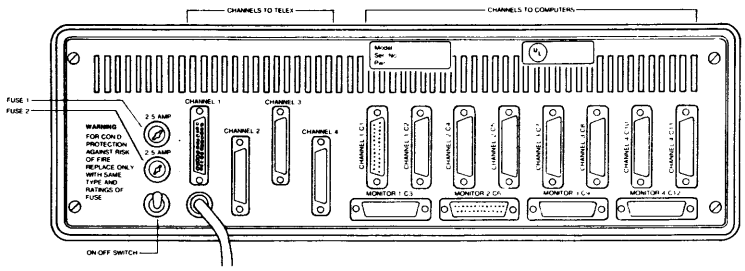
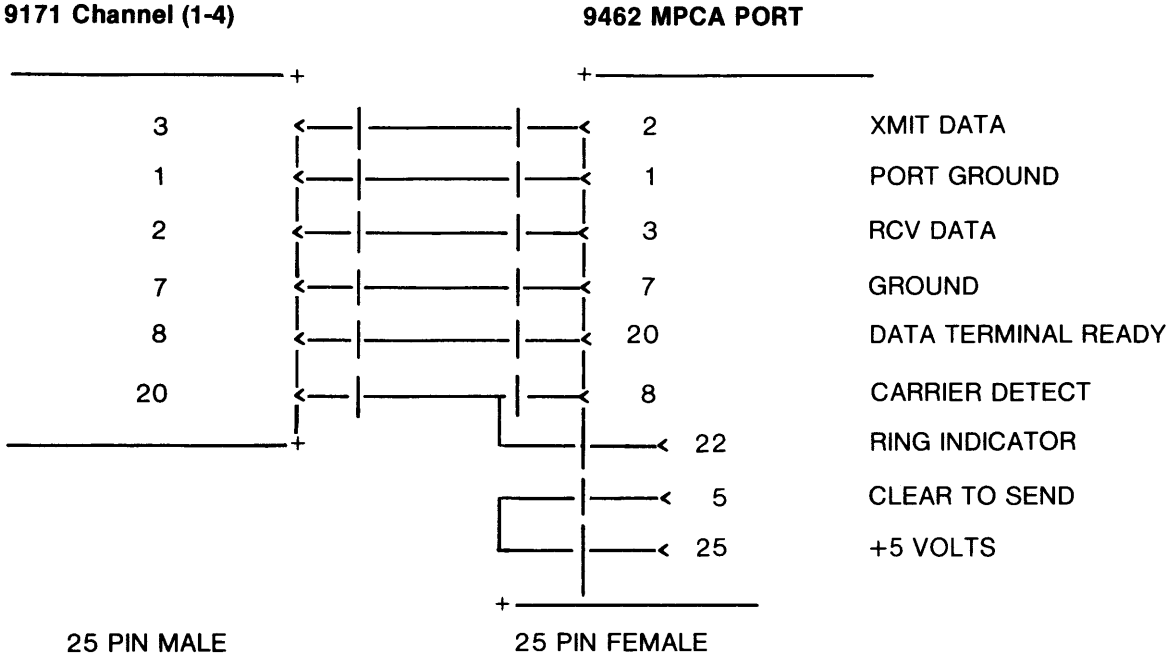


Figure 6-1: 9171 Rear Panel Connectors

9462 MPCA to 9171 Hardware Interface Module Pin Assignments



Pin Assignment are as follows:

Pin	Function	Use
2	Transmitted Data	Output
3	Received Data	Input
4	Request to Send	Output
5	Clear to Send	Input
6	Data Set Ready	Input
7	Signal Ground	Connection
8	Received Line Signal Detector	Input
20	Data Terminal Ready	Output
22	Ring Indicator	Input
25	+5 Volts	———
8	Connected with pin 22	———

Standard 25 pin connectors are provided for a monitor to be attached for each telex line.

6.3

9171 to Telex Network Interface

6.3.1

Netherlands

Cannon Connector #2, 5, 8, 11:

Pin	Signal Description
18	Received Data (Current Loop)
19	Received Data (Current Loop Return)
20	Transmitted Data (Current Loop)
21	Transmitted Data (Return)
24	Send Filter Control
25	Send Filter Control

Cannon Connector #3, 6, 9, 12 (Monitor connection only):

Pin	Signal Description
2	Signal Ground
13	Signal Ground
12	Transmitted Data (V 24)
24	Transmitted Data (Current Loop)
25	Transmitted Data (Return)

Cannon Connector #1, 4, 7, 10 not used.

6.3.2

France

Cannon Connector #1, 4, 7, 10:

Pin	Signal Description
1	101 Protective Ground
7	102 Signal Ground
2	103 Transmitted Data
3	104 Received Data
20	108/2 Data Terminal Ready
5	106 Clear to Send
6	107 Data Set Ready
8	109 RCV Line Signal Detector
22	125 Calling Indicator
18	132 Return to No Data Mode

Interconnected

Cannon Connector #2, 5, 8, 11:

Pin	Signal Description
4	202 Call Request
22	203 Data Line Occupied
??	220 Send Sequence

6.3.3

United Kingdom

Cannon Connector #1, 4, 7, 10:

Pin	Signal Description
1	101 Protective Ground
7	102 Signal Ground
2	103 Transmitted Data
3	104 Received Data
20	108/2 Data Terminal Ready
5	106 Clear to Send
6	107 Data Set Ready
8	109 RCV Line Signal Detector
22	125 Calling Indicator
18	132 Return to No Data Mode

Interconnected

Cannon Connector #2, 5, 8, 11:

Pin	Signal Description
7	201 Signal Ground
1	212 Protective Ground
4	202 Call Request
14	206 Digit 1
15	207 Digit 2
16	208 Digit 4
17	209 Digit 8
2	211 Digit Present
5	210 Present Next Digit
3	205 Abandon Call (Steady "OFF")
13	204 Distant Station Connected
22	203 Data Line Occupied
6	213 Power Indication

6.3.4

Luxembourg

Cannon Connector #2, 5, 8, 11:

Pin	Signal Description
18	4 Signal Path (Current Loop)
19	1 Signal Path (Current Loop)

Cannon Connector #1, 4, 7, 10 not used

6.3.5

United States

Cannon Connector #1, 4, 7, 10:

Pin	Signal Description
1	Protective Ground
7	Signal Ground
2	Transmitted Data
22	Received Data

Cannon Connnector #2, 5, 8, 11 not used

Cannon Connector #3, 6, 9, 12 Monitor connection only

Pin	Signal Description
2	Signal Ground
13	Signal Ground
12	Transmit Data (V24)
24	Transmit Data (Current Loop)
25	Transmit Data (Current Loop Return)

7.0

OPTIONS

The 9171 Hardware Interface Module can be configured for operation in the following countries:

The Netherlands
France
United Kingdom
Luxembourg
United States

8.0

SHIPPING LIST

The following items are shipped with each Hardware Interface Module:

Quantity	Item
1	*Product Specification*
1	*Installation Guide*
1	*Kit, ITMS System Cables, Installation*

Note: This shipping list is provided for information only and may be amended from time to time by Datapoint Corporation without prior notification.