3635–00 Asynchronous Data Channel Unit

CONTENTS PAGE

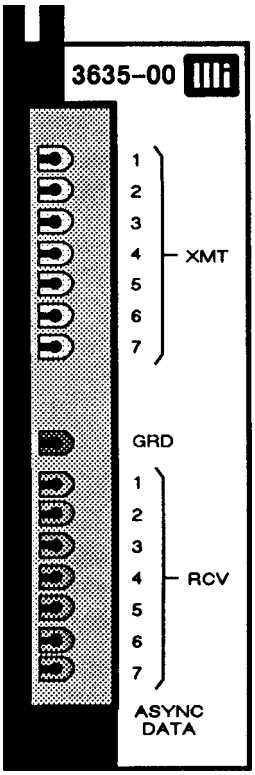

Figure 1. 3635–00 Front Panel

1. GENERAL

1.1 Document Purpose

This document provides information on the Charles Industries 3635–00 Asynchronous Data Channel Unit used in the Charles Industries 360 and 363 D4 PCM Carrier Terminals. The 3635–00 is depicted in Figure 1.

1.2 Document Status

This document is reprinted to provide a general editorial update.

1.3 Equipment Function

The 3635–00 is designed to insert seven asynchronous data channels into a single channel time slot of the 360/363 Terminal. The input and output interfaces of the 3635–00 are RS–232C compatible. The RS–232C interface leads provided by the 3635–00 are the BA (transmit data) and BB (receive data) leads. The 3635–00 does not provide an EIA connector or any other protocol leads.

The 3635–00 can be used with data rates up to 2400bps. However, the higher the data rate, the more transition delay will be introduced at the receive end. Transition delay is a function of the data rate and the PCM sampling rate (8000Hz). At a data rate of 800bps, each data bit will be sampled a minimum of ten times. This gives a maximum transition delay of 10 percent (800 / 8000 x 100 = 10 percent) (the average distortion will be somewhat lower). A data rate of 2400bps will have a maximum transition delay of 30 percent (2400 / 8000 x 100 = 30 percent). Many data terminals can operate satisfactorily with a maximum transition delay of 30 percent at 2400bps. The 3635–00 is not recommended for use with data rates above 2400bps. An example of transition delay is given in Figure 2.

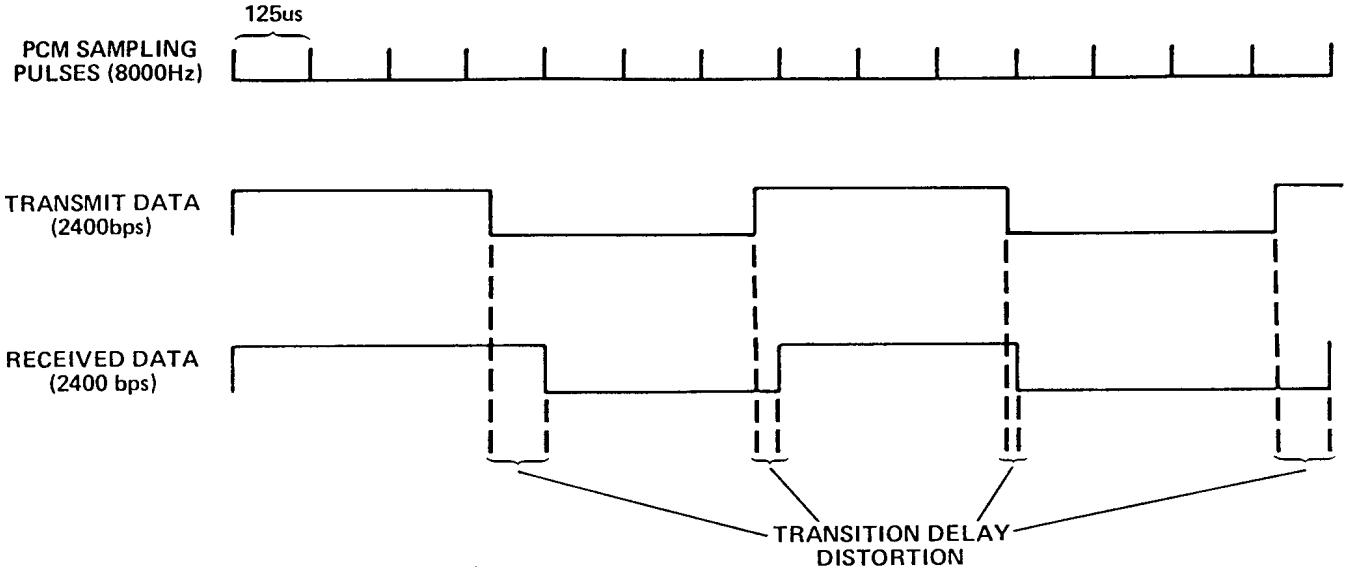

Figure 2. Transition Delay

2. CIRCUIT DESCRIPTION

Refer to Figure 3, the 3635–00 Asynchronous Data Channel Unit Functional Block Diagram, while reading the following circuit description.

2.1 Transmit Side

On the transmit side, the 3635–00 receives data from up to seven data terminals on leads XD–1 through XD–7 (pins 50, 8, 4, 9, 2, 46, and 24). The data consists of positive and negative pulses, with a positive pulse representing a space (logic 0) and a negative pulse representing a mark (logic 1). The INPUT INTERFACE LOGIC CIRCUITS convert the data to CMOS logic levels. Each input interface provides a 3k to 7k ohm unbalanced input impedance to its associated data terminal.

The data from the INPUT INTERFACE LOGIC CIRCUITS is applied to the DATA COMBINER AND T1 INTERFACE LOGIC, where it is combined in a parallel-to-serial register. At the appropriate channel time, the data is

clocked out of the DATA COMBINER AND Tl INTERFACE LOGIC onto the T1 XMT BUS, which routes the data to the 360/363 common equipment. The common equipment combines the transmit data with the information from the other channels in the terminal for transmission over a Tl or TlC facility. During an alarm condition, the ALARM DETECTOR will cause the DATA COMBINER AND Tl INTERFACE LOGIC to output ail ones on the Tl XMT BUS.

2.2 Receive Side

Receive data from the common equipment is applied to the 3635–00 on the Tl RCV BUS. At the appropriate channel time, the data is clocked into the T1 INTERFACE AND DATA STEERING LOGIC, which separates the seven data streams and applies them to the OUTPUT DRIVER CIRCUITS. The OUTPUT DRIVER CIRCUITS supply a +/–8V to +/–12V digital signal into a load impedance of 3k to 7k ohms. The signals from the OUTPUT DRIVER CIRCUITS are routed to the data terminals on leads RD–1 through RD–7 (pins 48, 7, 45, 43, 6, 41, and 23). The OUTPUT DRIVER CIRCUITS can be optioned to provide either a mark or a space to the data terminals during an alarm condition.

2.3 Trunk Processing

One Carrier Group Alarm (CGA) bus from 3606–00/30 ALU is used by the 3635–00. The CGAI bus (pin 18) goes to ground immediately upon the beginning of trunk processing. The ALARM DETECTOR detects the ground on the CGAI lead and forces the DATA COMBINER AND Tl INTERFACE LOGIC to transmit all ones to the far end. The ALARM DETECTOR also sends a signal to the OUTPUT DRIVER CIRCUITS which causes them to output either a mark or a space, to the data terminals, depending on the option settings. At the end of trunk processing, the 3635–00 restores normal operation.

3. INSPECTION

3.1 Inspect for Damages

Inspect the equipment thoroughly upon delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

3.2 Equipment Identification

Charles Industries' equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by 1 and imprinted on subsequent units manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

3.3 Static Protection

Each module is shipped in static-protective packaging to prevent electrostatic charges from damaging static-sensitive devices. Use approved static-preventive measures, such as static-conductive wrist straps and a static-dissipative mat, when handling modules outside of their protective packaging. A module intended for future use should be tested as soon as possible and returned to its original protective packaging for storage.

Do not ship or store modules near strong electrostatic, electromagnetic, or magnetic fields. Use the original static-protective packaging for shipping or storage.

4. MOUNTING

The 3635–00 is designed to mount in one channel unit slot of a 360/363 Terminal. The 3635–00 is equipped with an insert/eject lever in the form of a hinged front panel. The insert/eject lever insures positive connection of a channel unit's card-edge connector to the backplane connector when the unit is installed, and provides easy removal of the unit.

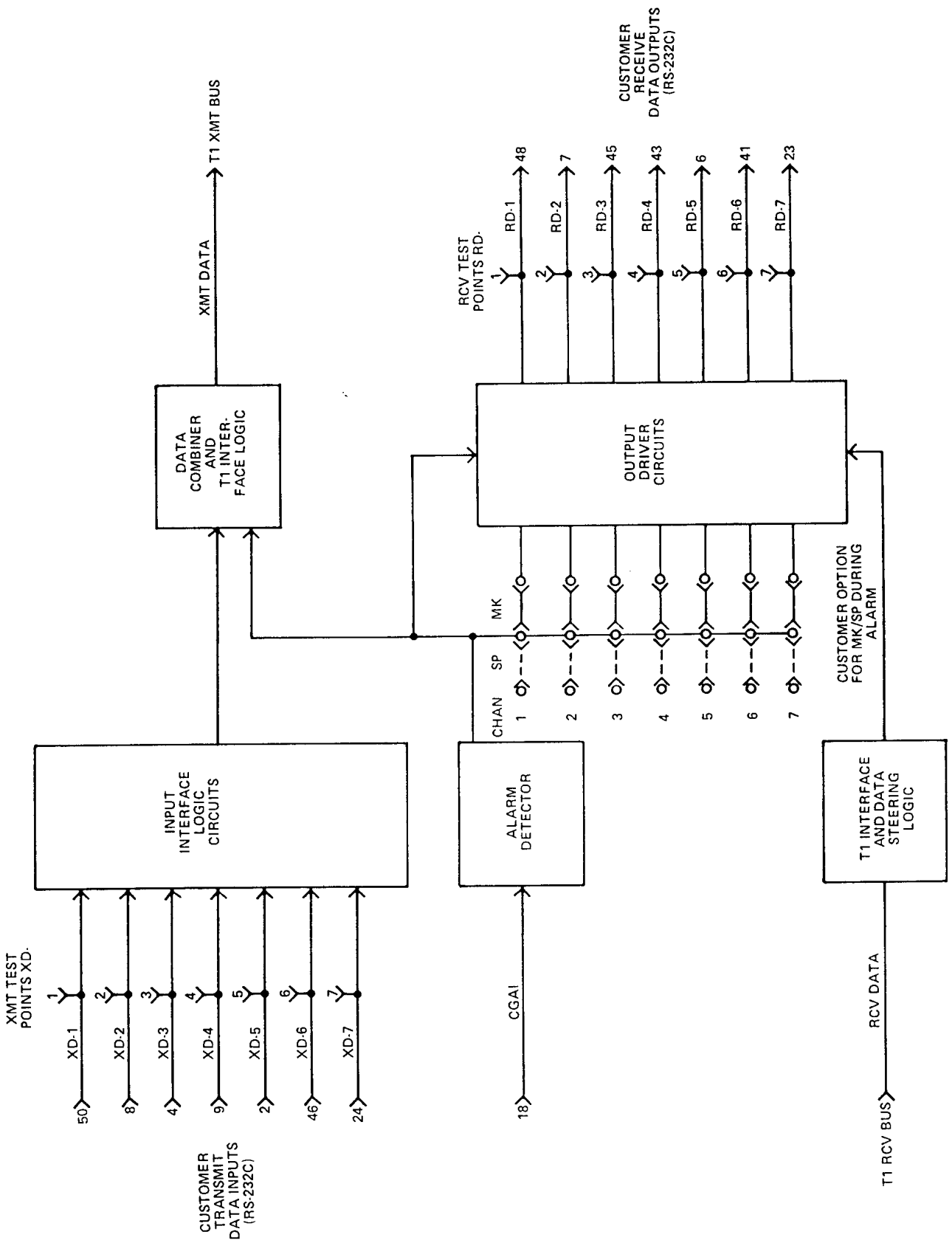

Figure 3. 3635–00 Asynchronous Data Channel Unit (Issue 1) Functional Block Diagram

5. INSTALLER CONNECTIONS

Installer connections to the unit are made via wire-wrapped connectors on the backplane of the 360/363 terminal. Make the installer connections to the 3635–00 in accordance with Table 1 and Figure 4. If more than one 3635–00 is being installed in a 360/363 Terminal, the installer connections must be made for each unit. Refer to sections 360–000–200 and 363–000–200 for installer connections in a connectorized 360/363 channel bank assembly. To insure proper operation the data terminal and the 360/363 terminal must share a common office ground.

Table 1. 3635–00 Installer Connections

RS–232C Lead Designation	Lead	Pin		Equivalent Voice Channel Lead
BA–1	XD–1 (Transmit Data Channel 1)	50		T
BA–2	XD–2 (Transmit Data Channel 2)	8		T1
BA–3	XD–3 (Transmit Data Channel 3)	4		E
BA–4	XD–4 (Transmit Data Channel 4)	9		EB
BA–5	XD–5 (Transmit Data Channel 5)	2		E2
BA–6	XD–6 (Transmit Data Channel 6)	46		PN1
BA–7	XD–7 (Transmit Data Channel 7)	24	360/363 Terminal Connectors J1A through J24A and J1B through J24B	—
BB–1	XD–1 (Receive Data Channel 1)	48		R
BB–2	XD–2 (Receive Data Channel 2)	7		R1
BB–3	XD–3 (Receive Data Channel 3)	45		M
BB–4	XD–4 (Receive Data Channel 4)	43		MB
BB–5	XD–5 (Receive Data Channel 5)	6		M2
BB–6	XD–6 (Receive Data Channel 6)	41		PN2
BB–7	XD–7 (Receive Data Channel 7)	23		—

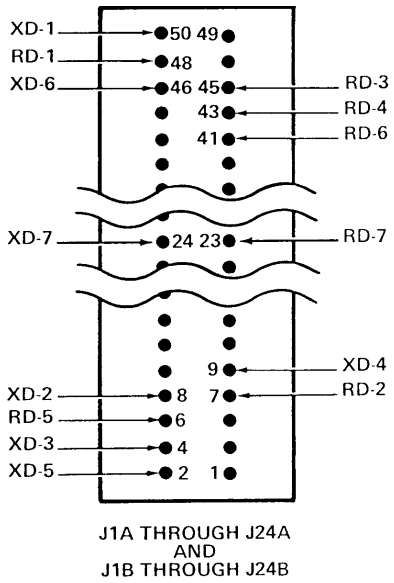

Figure 4. 3635–00 Installer Connections

6. OPTIONS

The 3635–00 is provided with a push-on jumper for each data channel. The location of the jumper for each data channel is shown in Figure 5. The push-on jumpers are used for selecting a mark (negative voltage) or a space (positive voltage) to the output driver circuits during an alarm condition. To provide a mark for any given data channel, place the push-on jumper for that channel in the MK position. To provide a space for any given data channel, place the push-on jumper for that channel in the SP position.

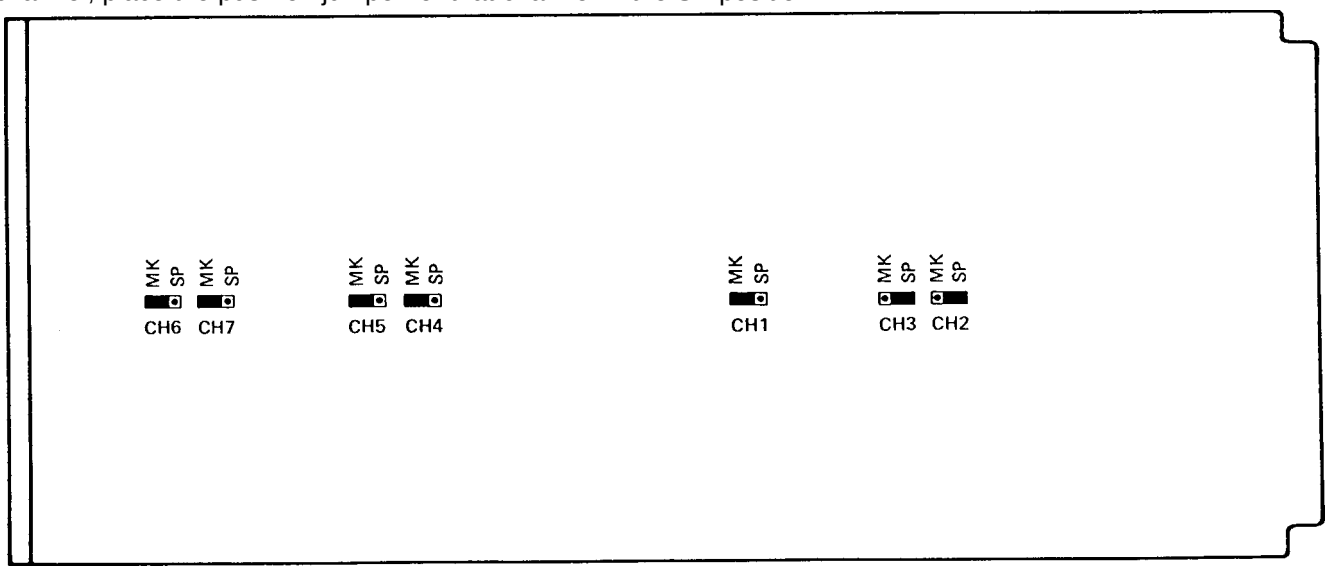

Figure 5. 3635–00 Option Locations

7. TESTING

If trouble is encountered with the operation of the 3635–00, make sure all installer connections to the 3635–00 have been made in accordance with Table 1 and Figure 4.

8. TECHNICAL ASSISTANCE

8.1 Technical Assistance — U.S.

If technical assistance is required, contact Charles Industries' Technical Services Center at:

847–806–8500
847–806–8556 (FAX)
800–607–8500
techserv@charlesindustries.com (e-mail)

8.2 Technical Assistance — Canada

Canadian customers contact:

905–821–7673 (Main Office)
905–821–3280 (FAX)

9. WARRANTY & CUSTOMER SERVICE

9.1 Warranty

Charles Industries, Ltd. offers an industry-leading, 5-year warranty on products manufactured by Charles Industries. Contact your local Sales Representative at the address or telephone numbers below for warranty details.

The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles Industries, Ltd.
5600 Apollo Drive
Rolling Meadows, Illinois 60008–4049
847–806–6300 (Main Office)
847–806–6231 (FAX)

9.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles Industries, Ltd. for replacement or repair instructions, or follow the *Repair Service Procedure* below.

9.3 Advanced Replacement Service (In-Warranty Units)

Charles Industries, Ltd. offers an “advanced replacement” service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the preaddressed shipping label provided. Call your customer service representative at the telephone number above for more details.

9.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles Industries, Ltd. offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles Industries for either repair and quality testing or exchanged for a replacement unit, as determined by Charles Industries. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact the CI Service Center at 217–932–5288 (FAX 217–932–2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.

2. Include the following information:

   – Company name and address
   – Contact name and phone number
   – Inventory of equipment being shipped
   – Particulars as to the nature of the failure
   – Return shipping address

3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

   CI Service Center
   Route 40 East
   Casey, IL 62420–2054

4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.

10. SPECIFICATIONS

The physical and electrical characteristics of the 3635–00 Data Channel Unit are as follows:

10.1 Electrical

10.1.1. Input Interface Circuits

(a) INPUT IMPEDANCE: 3K unbalanced.

(b) INPUT SENSITIVITY: +3V, to 7K ohms, minimum.

(c) OPEN CIRCUIT VOLTAGE: +2V, maximum.

(d) LOAD CAPACITANCE TO GROUND: 2500pF, maximum.

10.1.2. Output Driver Circuits

(a) SHORT CIRCUIT CURRENT: 500mA, max.

(b) OPEN CIRCUIT VOLTAGE: +25V, maximum

(c) OUTPUT VOLTAGE (into 3K to 7K ohms load): +5V to +15V.

10.2 Physical

See Table 2 for the physical characteristics of the unit.

Table 2. Physical Specifications

Feature	U.S.	Metric
Height	4.2 inches	10.6 centimeters
Width	1.35 inches	3.4 centimeters
Depth	10.3 inches	26.7 centimeters
Weight	6.5 ounces	182 grams
Temperature	32° to 122° F	0° to 50° C