



Wescom Telephone Products Division
WTPD Practices

Section 748-003-201

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Wescom 7480-03 2-Wire Customer Service Unit (CSU) Interface

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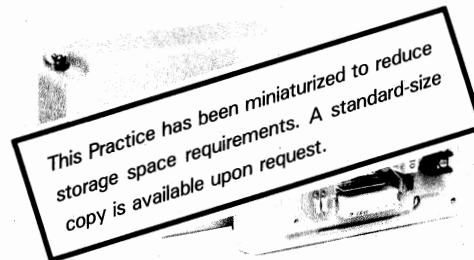


Figure 1. 7480-03 2-Wire CSU Interface

1. GENERAL

1.01 This Practice provides circuit description, installation procedures, and basic testing information for the Wescom 7480-03 2-Wire Customer Service Unit (CSU) Interface, shown in Figure 1.

1.02 Whenever this Practice is reissued, the reason for reissue will be stated in this paragraph.

1.03 The 7480-03 is a self-contained module complete with mounting case used to interface between 2-wire voiceband data station equipment and a 2-wire private line service or polled network service.

1.04 The 7480-03 provides the following features:

- Fixed 2-WIRE STATION (SIDE A) terminating impedance of 600 ohms
- Switch selectable 2-WIRE LINE (SIDE B) terminating impedances of 150, 600 or 1200 ohms

- SIDE B voltage surge protection
- 0 to 15.75dB prescription attenuation in 0.25dB increments
- Access to simplex leads for both SIDE A and SIDE B
- Transformer interface on both SIDE A and SIDE B
- Loop current blocking option on SIDE B, for alignment on 2-wire polled network service circuits
- Terminal block for installer connections
- Wiring diagram label on inside cover for aid in installation
- Passive design providing uninterrupted service during power outage
- Mounting screws provided
- Captive screws on cover for easy assembly
- Full 5 year warranty

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2. APPLICATION GUIDELINES

2.01 The 7480-03 is used to interface between 2-wire voiceband data station equipment and a 2-wire private line service or polled network service such as the Transaction Network or the DATAPHONE® Select-A-Station. A typical application is shown in Figure 2. The 7480-03 can also be used to interface a carrier 2-wire extended loop but the dc current blocking option (S1) cannot be used.

2.02 The 7480-03 protects company equipment and personnel from undesirable potentials that may be placed on the line by customer equipment. In addition, the customer equipment is protected from voltage surges originating on the line.

3. CIRCUIT DESCRIPTION

3.01 Refer to Figure 3, the 7480-03 2-Wire CSU Block Diagram, while reading the following circuit description.

3.02 The 7480-03 is designed with only passive components and therefore no external dc power is required. The circuit of the 7480-03 consists of a barrier strip, connecting block with screw terminals, SIDE B impedance switch, transformers, dc blocking capacitor

screw option, and prescription DIP switch attenuator.

3.03 The VF signals can pass through the unit in either direction, SIDE A to SIDE B or SIDE B to SIDE A. For purposes of description, the VF signal is assumed to enter SIDE B and leave SIDE A. For normal operation the screw option S1 is assumed to be in the CLOSED (ON) position.

3.04 The VF signal enters the 7480-03 on SIDE B via barrier strip TB1 T and R, passes through screw option S1, through impedance switch S2, and into transformer T1. The signal is coupled to the secondary of T1 and is conditioned by the prescription attenuator S3 before passing onto transformer T2. The signal is then coupled through T2 and passes through barrier strip TB1 CT and CR to SIDE A and into the customer equipment.

4. INSPECTION

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

4.02 Wescom 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

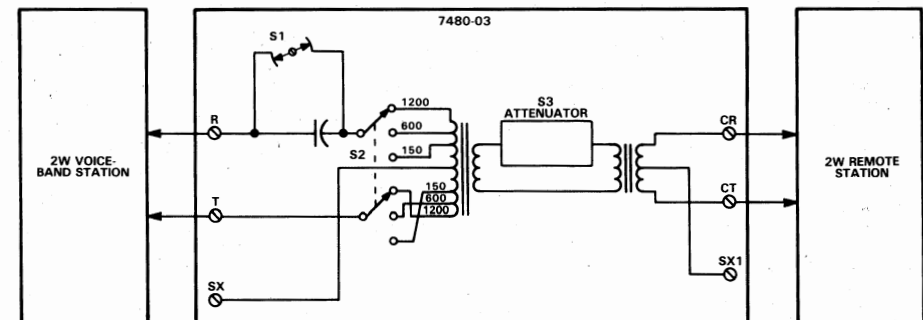


Figure 2. 7480-03 Typical Application

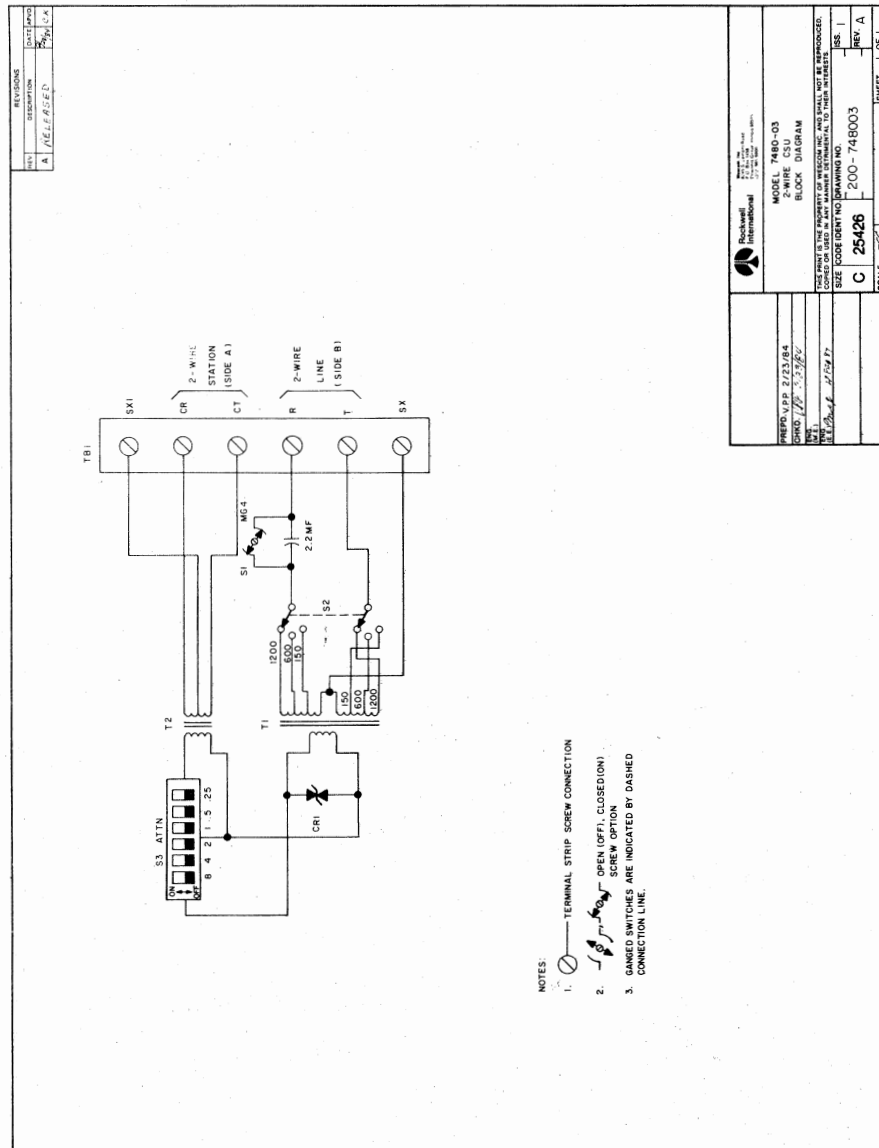


Figure 3. 7480-03 2-Wire CSU Interface Block Diagram

design change is made on the equipment, the issue number is advanced by one number on any following models that are manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

5. MOUNTING

5.01 The 7480-03 is a self-contained unit consisting of a base and a cover. It may be mounted on a wall or directly over a conduit box. Install the base with the two mounting screws to allow unobstructed access to installer connections. After installer connections are made and the circuit is properly conditioned and tested, install the cover with the two captive screws provided. The 7480-03 has no position sensitive components and therefore may be mounted in any position by using any of the screwholes on the base.

6. INSTALLER CONNECTIONS

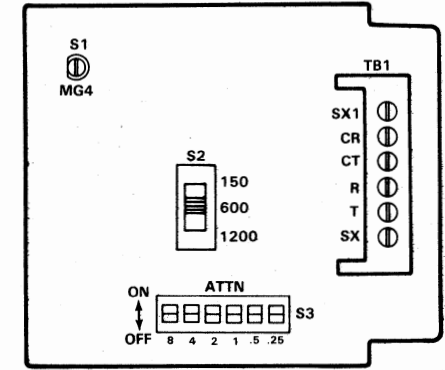
6.01 Make all installer connections to the terminal block according to Table 1. Installed wires may be fed through the holes provided on the base, then connected to designated terminating points.

Table 1. 7480-03 Installer Connections

LEAD DESIGNATION	BARRIER STRIP TB1 SCREW TERMINAL
T } 2-WIRE STATION R } (SIDE A)	CT CR
T } 2-WIRE LINE R } (SIDE B)	T R
Simplex Lead, SIDE A	SX1
Simplex Lead, SIDE B	SX

7. OPTIONS

7.01 The 7480-03 contains one screw option, one slide switch option, and one DIP switch. Refer to Figure 4 for the location of these options.



DESIGNATION	POSITION	FUNCTION
S1	OPEN (OFF)	Alignment only, on polled network service to activate circuitry in the CO to apply a 1000Hz test tone.
	CLOSED (ON)	Normal operation position.
S2	150	Conditions SIDE B for 150 ohm impedance.
	600	Conditions SIDE B for 600 ohm impedance.
	1200	Conditions SIDE B for 1200 ohm impedance.
S3	—	Constant impedance attenuator pad controlled by six position DIP. Each switch attenuation is additive in 0.25dB steps for a total range of 0 to 15.75dB.

Figure 4. 7480-03 Option Locations

Screw Option S1

7.02 Screw option S1 (MG4) is used for alignment purposes on a 2-wire polled network service only. Placing S1 to the OPEN (OFF) position will block the dc current flow from the 2-wire facility and cause a -18dBm, 1kHz tone to be applied to the 2-wire line. Refer to Part 8 for alignment procedure.

Slide Switch S2

7.03 Slide switch S2 controls the impedance of the 2-WIRE LINE (SIDE B), which can be 150, 600, or 1200 ohms. The 2-WIRE STATION (SIDE A) is always 600-ohm impedance.

Attenuator DIP Switch S3

7.04 DIP switch S3 contains a set of six switches. By placing the switch to the ON position (opposite the dB markings), that amount of attenuation is inserted into the transmission path. The switches are additive in 0.25dB increments so that if all the switches on S3 were placed to the ON position, the total attenuation would be 15.75dB. The total loss of the module is equal to the attenuator pad plus the insertion loss.

8. ALIGNMENT

8.01 The alignment of the 7480-03 consists of adjusting S3 for the proper levels. Condition the module for proper application by placing S2 in the appropriate position for SIDE B impedance and turning screw option S1 to the CLOSED (ON) position. Connect the T and R (SIDE B) wires to the 7480-03 terminal block and place all switches on S3 to the OFF position. (Do not connect the CT or CR wires.)

8.02 If the 7480-03 is used in a 2-wire private line service and the desired loss is specified on the service order, then subtract the

insertion loss (2.5dB) and set the attenuator S3 for the remaining attenuation required.

Example

Desired loss of the 7480-03 is 12dB. Subtract 2.5dB from 12dB = 9.5dB. Set S3 switches 8, 1, and .5 to the ON position; leave switches 4, 2, and .25 OFF. (8dB + 1dB + 0.5dB = 9.5dB loss required.)

8.03 If the 7480-03 is used in a private line where the expected measured loss (EML) is specified on the service order, refer to Table 2 for alignment procedure.

8.04 If the 7480-03 is used in a polled network that is metallic, refer to Table 3 for alignment procedure.

8.05 If the 7480-03 is used in a polled network using nonmetallic facilities such as T-carrier on remote office facilities, then the S1 option cannot be used and S1 must be placed in the CLOSED (ON) position. In this instance, the alignment procedure is the same as for the private line service. (See Paragraph 8.02 or 8.03.)

Table 2. Transmission Alignment Procedure For The 7480-03 (Nonmetallic Facility)

TEST EQUIPMENT REQUIRED:	
One Transmission Measurement Set (TMS) such as a WESTERN ELECTRIC 23A, HEWLETT-PACKARD 3550, or equivalent.	
STEP	INSTRUCTION
1	Place screw option S1 to the CLOSED (ON) position. Connect the TMS to the CT and CR screw terminals and condition the TMS for a 600-ohm terminated measurement.
2	Request the CO to send a 1000Hz test tone at 1mW level.
3	Measure the level at the TMS and adjust the switches on S3 for the expected measured loss (EML) as indicated by the TMS.
4	Record the setting of S3 on the Circuit Layout Record Card (CLRC). Arrange for the 1000Hz test tone to be removed.
5	Disconnect the TMS. If required, connect the 2-WIRE STATION (SIDE A) wires CT and CR and replace the cover on the 7480-03.

Table 3. Transmission Alignment Procedure For The 7480-03 (Metallic Facility)

TEST EQUIPMENT REQUIRED:	
One Transmission Measurement Set (TMS) such as a WESTERN ELECTRIC 23A, HEWLETT-PACKARD 3550, or equivalent.	
STEP	INSTRUCTION
1	Place screw option S1 to the CLOSED (ON) position. Connect the TMS to the CT and CR screw terminals and condition the TMS for a 600-ohm terminated measurement.
2	Place screw option S1 to the OPEN (OFF) position. The TMS should show a marked increase in level (-17.5 to -30.5dBm), indicating the presence of the 1000Hz test tone. If not, contact the local test desk (LTD).
3	Measure the level at the TMS and if necessary, adjust the switches on S3 for a TMS indication of between -29.5 and -30.5dBm.
4	Record the setting of S3 on the Circuit Layout Record Card (CLRC). Place screw option S1 to the CLOSED (ON) position. The TMS should show a marked decrease in level, indicating the test tone has been removed. If not, contact the LTD.
5	Disconnect the TMS. If required, connect the 2-WIRE STATION (SIDE A) wires CT and CR and replace the cover on the 7480-03.

9. TESTING

9.01 If trouble is encountered with the operation of the 7480-03, verify that all installer connections have been properly made in accordance with Table 1. Verify that the correct line impedance is being used and that the attenuator is set for the required level. If technical assistance is required, contact the Wescom Technical Services Department by calling:

(312) 985-9000,
TWX 910-695-4735,
DATAPHONE® (312) 985-1700, or
TELEX 253-656

Canadian Customers:
(416) 877-0191,
TWX 610-492-2646, or
TELEX 06-97777

10. WARRANTY

10.01 WARRANTY: Wescom offers an industry leading five (5) year warranty on products of Wescom's manufacture. Contact your local

Wescom Sales representative for details of Wescom's warranty. 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.

10.02 Field repairs involving the replacement of components within a unit are not recommended. If an item is found to be defective, contact Wescom, Inc., by telephone, letter, or TWX, for instructions regarding replacement or repair.

10.03 If a replacement unit is required, it will be shipped in the fastest manner consistent with the urgency of the situation. Upon receipt of a replacement unit, return the defective unit in the carton in which the replacement was shipped, using the shipping label provided, to:

Wescom, Inc.
8245 Lemont Road
Downers Grove, Illinois 60515

Canadian Customers:
Rockwell International of Canada Ltd.
Wescom Canada Division
45 Sinclair Ave.
Halton Hills (Georgetown)
Ontario L7G 4X4

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Repair Or Exchange Services

10.04 In addition to the standard Wescom Warranty Service, Wescom offers a repair or exchange service for those items out of warranty. Under this arrangement, faulty units may be shipped to Wescom and either completely repaired and quality tested or exchanged for a replacement unit. To obtain details of this service and a schedule of prices, contact your local Wescom Sales Representative.

11. SPECIFICATIONS

11.01 The electrical and physical characteristics of the 7480-03 are as follows:

- (a) 2-WIRE STATION (SIDE A) IMPEDANCE: 600 ohms.
- (b) 2-WIRE LINE (SIDE B) IMPEDANCE: Switch selectable 150, 600, 1200 ohms.
- (c) 2-WIRE ATTENUATION: 0 to 15.75dB in 0.25dB increments.
- (d) INSERTION LOSS: 2.5dB typical.
- (e) SIMPLEX CURRENT: 80mA maximum.
- (f) LOOP CURRENT: 50mA maximum, SIDE B only.
- (g) LIGHTNING PROTECTION: 1000 volts peak, with $\frac{1}{2}$ peak voltage in 0.001 seconds, SIDE B only.
- (h) OPERATING ENVIRONMENT: Temperature, 32 ° to 120 °F (0 ° to 49 °C).
- (i) DIMENSIONS: Height, 4.3 in. (10.8cm); width, 5.5 in. (14.0cm); depth, 1.9 in. (4.8cm).
- (j) WEIGHT: 8.5 oz (241g).
- (k) MOUNTING: Self-contained wall-mount unit. May also be mounted directly over a conduit box.