UT203 FID

Installation and Start-up Manual

Carrier COMFORT NETWORK

UT203 FID

Installation and Start-up Manual

Contents

Illustrations

Tables

Foreword

This manual is for use by Carrier Corporation technical representatives.

The manual is divided into three sections.

Section One is the Introduction and presents general information on the UT203 Field Installed Device (FID) and the start-up and installation procedures. It includes sketches of the UT203 FID as well as a brief outline of the total UT203 FID installation and start-up process. A list of required tools and materials is included.

Section Two is written to guide the Carrier technician through the initial start-up, configuring, and troubleshooting of the UT203 Field Installed Device.

Section Three discusses remote I/O module installation techniques and restrictions.

This manual is written for use in the USA. The voltages and engineering units are in customary U.S. units.

This manual should be used in conjunction with the following documentation:

UT203 Owner's Module Operation Manual
Module Wire Lists and Configuration sheets for the specific FID
UT203 FID Overview and Configuration Manual
CCN Contractor's Manual

Startup of all UT203 Field Installed Devices must be performed by quaified service technicians.

Introduction

Section 1

UT203 FID Overview

Carrier Corporation's UT203 Field Installed Device (FID) is a stand-alone, microprocessor-based device that gathers data from environmental sensors and regulates building HVAC equipment through closed-loop, direct digital control.

The UT203 FID is used to allow the Carrier Comfort Network (CCN) to communicate with and control non-Carrier equipment and Carrier HVAC equipment that is not equipped with PIC controls.

The UT203 FID (Figure 1) uses Carrier Corporation's proven algorithms and BEST programming and is able to handle up to 64 points in almost any combination of inputs or outputs. The total number of hardware points that may be connected to the UT203 FID is only 60; Points 61 through 64 are software points reserved for the Broadcast function, the Data Transfer Option, or BEST programs.

The overall design of the UT203 FID consists of individual modules that read and control the various input and output points that are connected to the UT203 FID. The modules currently available for the UT203 FID include a Power Supply, Processor, Current to Pressure (CLIP), and three different 8 point Input/Output (I/O) Modules which are individually chosen to allow customized point configuration for up to 64 points in each UT203 FID.

Any point in the UT203 FID that is not used for hardware can act as a software point in a BEST program, or can be used to share information among system elements using a Data Transfer Option. An I/O module need not be present in the UT203 FID in order to use these points.

The Power Supply provides enough power to operate the Processor and up to 8 additional modules as described in the **Power Supply Installation** section. It is important to note, however, that the CLIP Module requires only 1/2 the power that an I/O module does; thus, when calculating the capacity of the Power Supply, 2 CLIPS count as 1 module.

The UT203 FID enclosure is 20" high, 20" wide, and 10" deep. It can hold a Power Supply, a Processor and up to 6 additional modules. If the application requires more than 6 modules, an additional UT203 FID enclosure can be used as a secondary enclosure. When used as a secondary enclosure, a UT203 FID enclosure can hold 9 I/O or CLIP Modules.

Once the desired mix of modules is selected, they are mounted inside the UT203 FID enclosure using the screws provided. I/O modules and CLIP Modules may be remotely mounted at a distance of up to 1000 feet from the Processor Module. Remote mounting of these modules is subject to the limitations outlined in **Section 3** of this manual.

This modular construction makes the UT203 FID a highly flexible controller and reduces overall installation costs.

In addition to operating as stand-alone units, UT203 Field Installed Devices can also be monitored by Carrier's Building Supervisor.

When a UT203 FID is linked to the Carrier Comfort Network, information from it can be utilized throughout the network by means of the UT203 FID's Broadcast function and the Data Transfer Option.

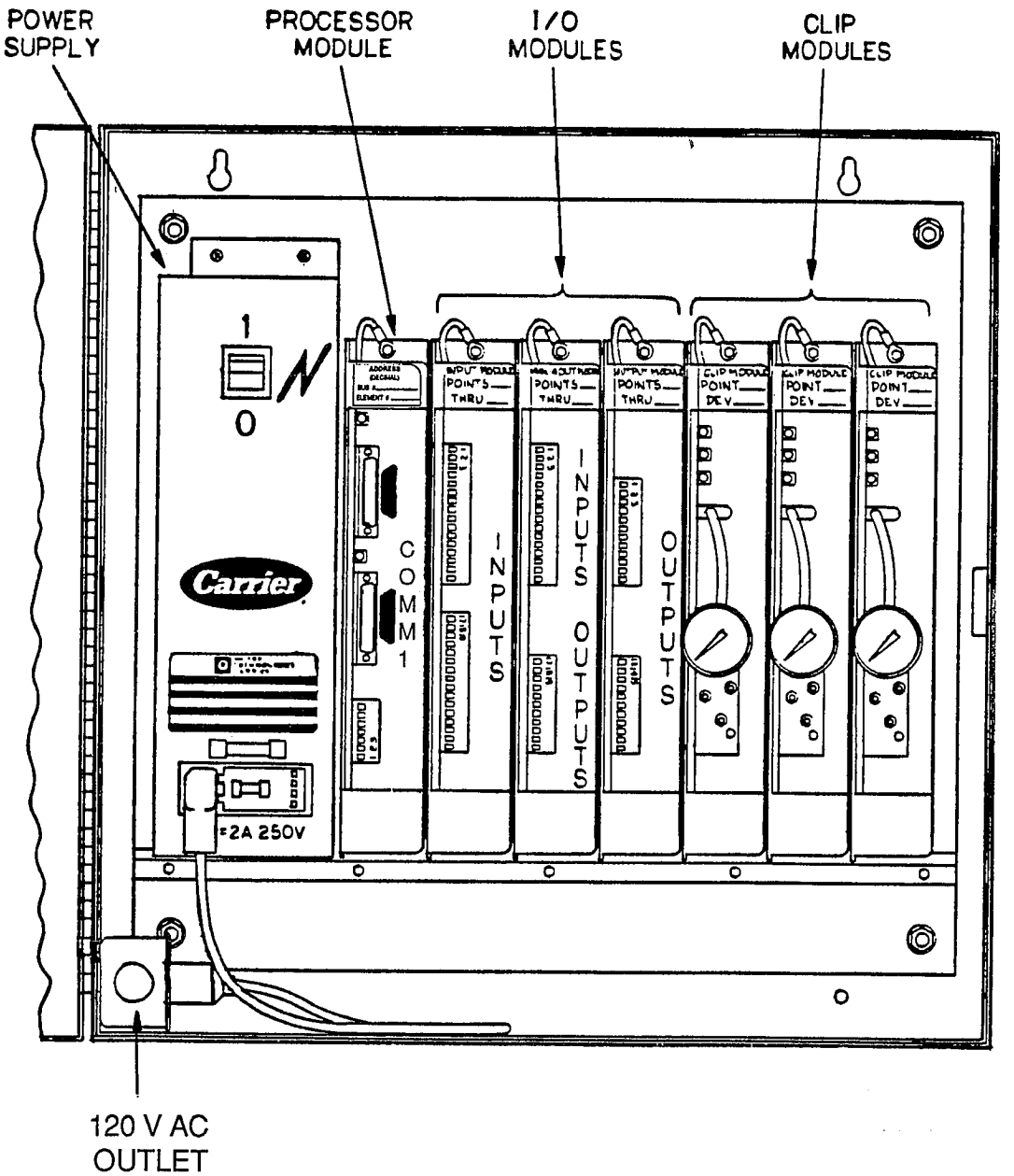


Figure 1 - UT203 Field Installed Device

Installation Phases

UT203 FID installation consists of five phases. The Contractor is responsible for phases two and four, and may be required to complete phase three. The Carrier representative performs phases one, three, and five. The duties in each phase are summarized below in order of their occurrence.

Phase One (Performed by Carrier Representative)

1. Complete all system design work.
2. Complete configuration sheets.

Phase Two (Performed by the Contractor)

1. Mount UT203 FID enclosure(s).
2. Wire power to the UT203 FID enclosure(s).
3. Run CCN Communication Bus wiring to the UT203 FID enclosure(s).
4. Run all device and sensor wiring to UT203 FID enclosure(s).
5. Run any pneumatic lines to the UT203 FID enclosure(s).

Phase Three (May be Performed by Carrier Representative or Contractor)

Install Power Supply, Processor, all I/O modules, and all CLIP Modules in UT203 FID enclosure(s).

Phase Four (Performed by the Contractor)

1. Terminate all CCN Communication Bus wiring.
2. Run module power wiring.
3. Run module communication wiring.
4. Terminate all device and sensor wiring to the modules.
5. Connect any pneumatic lines to the CLIP Modules.

Phase Five (Performed by Carrier Representative)

1. Check field wiring.
2 Verify that UT203 FID is operational.
3. Configure UT203 FID.
4. Check input and output device operation.

Step-by-step instructions for performing the Carrier Representative's duties are included in this manual.

Contractor instructions are included in the *CCN Contractor's Manual.*

Required Materials

Tools:

UT203 Owner's Module (OM)
Volt Ohmmeter (VOM)
1/8" Blade Screwdriver
1/4" & 5/16" Nut Drivers with 6" extension
Small Needle Nose Pliers

Reference Materials:

UT203 FID Owner's Module Operation Manual - CECD121032
Module Wire Lists and Configuration sheets for each UT203 FID
UT203 FID Overview and Configuration Manual - CECD121055
CCN Contractor's Manual - CECD121056

Carrier Technician's Start-up Information

Section 2

Power Supply Installation

note The Power Supply provides up to 4A of power at 28 Vdc for use by I/O and CLIP Modules. Each I/O module requires 0.5A and the CLIP Module requires 0.25A. *Do not* include the Processor Module in your power calculations.

1. Unpack the Power Supply and discard the packing.

2. Examine the fuse compartment cover. A red square indicates the voltage setting. If the setting needs to be changed, detach the power cord, open the fuse compartment and, using small needle nose pliers, remove the small PC board.

   Various voltages can be selected by rotating this board. Rotate and reinsert so that the proper voltage is indicated when the cover is closed. Refer to Figure 2.

3. Verify that the power switch is OFF.

4. The Power Supply can only be positioned in the leftmost slots of the mounting backplate. Mount the Power Supply by hooking the bottom of the module into the mounting rail and securing the top with the two 10 x 32 slotted, hex head, self-tapping screws provided.

5. Attach power cord to module.

Do not plug in or turn on Power Supply at this time.

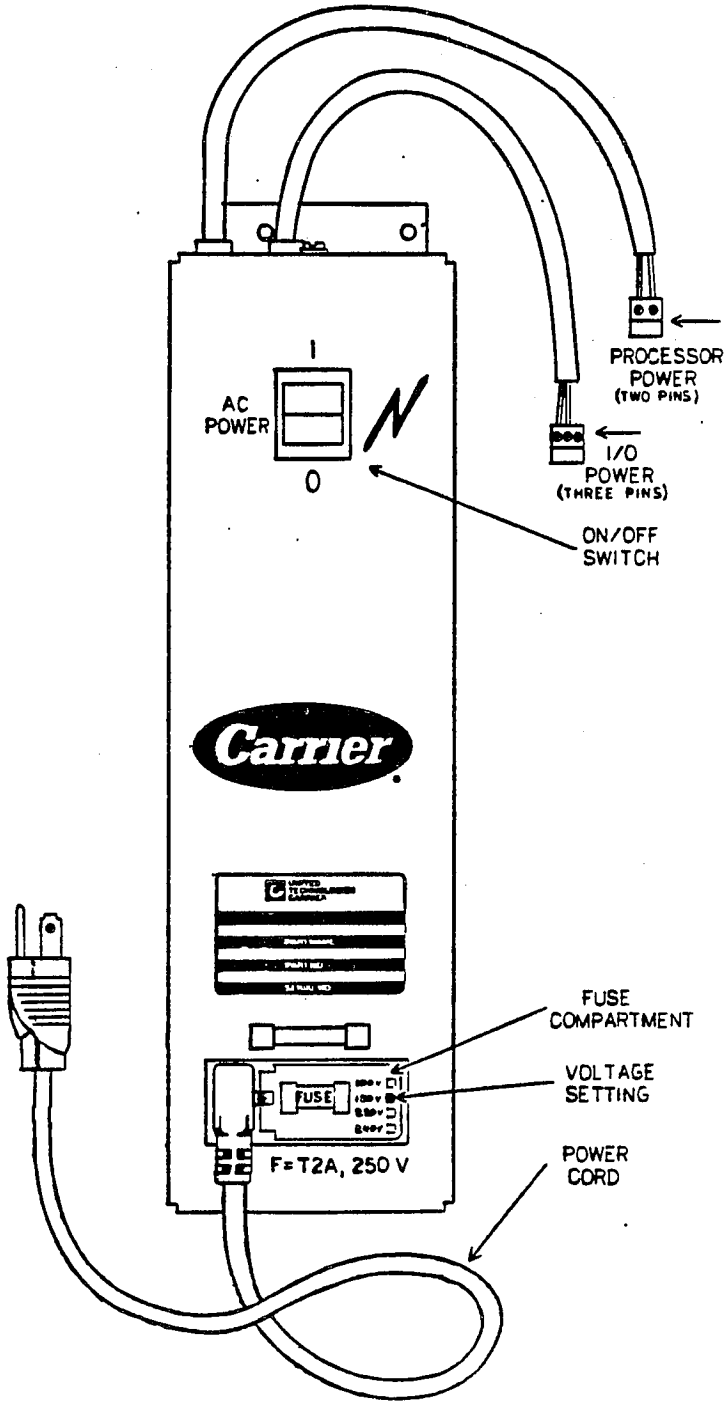


Figure 2 - UT203 FID Power Supply

Processor Module Installation

The UT203 FID's Processor Module can support a total of eight I/O modules. *The CLIP Module is not considered an I/O module.* Each I/O module accommodates 8 points (8 outputs, or 8 inputs, or 4 inputs and 4 outputs). A total of 60 hardware points may be connected to the UT203 FID. Points 61 through 64 are software points reserved for use with the Broadcast function, Data Transfer Option, or BEST programs.

note It is a good idea to set all module switches in a well lit area before proceeding to the location of the UT203 FID enclosure.

1. Remove the Processor Module from the box.

2. Check the COMM1 SPEED switch to verify its baud rate setting. (Refer to Figure 3 on page 9 for its location.)

   This switch is used to set the communication speed between:

   - the UT203 FID and the CCN communication bus, or
   - the UT203 FID and the Building Supervisor.

   For the CCN Communications Bus, the switch must be set to the same baud rate setting as all the other system elements (FIDs, Building Supervisor, CIO Modules, Repeaters, and Bridges) on the bus (usually 9600 baud).

   For Building Supervisor communication, the arrow on the front of the switch should be set to Position 4, 9600 baud.

   If the setting needs to be changed, use a 1/8" screwdriver to rotate the switch to the appropriate setting. Refer to Table 1 on page 10 for baud rate settings.

3. Check the COMM3 switch on the face of the module to verify its baud rate setting. Refer to Figure 3 on page 9 for the switch location.

   This switch sets the communication speed between the Processor Module and the I/O modules; the arrow on the front of the switch should be set to Position 4, 9600 baud. Refer to Table 1 on page 10 for baud rate settings. If the setting needs to be changed, use a 1/8" screwdriver to rotate the switch to the appropriate setting.

4. Set the S1 and S2 switches (Element # in Hexadecimal) to the appropriate settings. Refer to Figure 3 for the switch locations.

   Remember, these switches set the element number in hexadecimal. For decimal to hexadecimal conversions, refer to Table 2 on page 11.

5. Set the Line Termination switch to *CENTER*.

6. Set the COMM MODE switch to the appropriate setting (RS-232 - for Building Supervisor communications; RS-485 - for CCN Communication Bus). Refer to Figure 3 for its location.

7. Mount the module in the enclosure by hooking the bottom of the module into the mounting rail. Leave a 1/4" space between the Power Supply and Processor Module to allow for adequate ventilation.

   Secure the top, along with the green ground wire, using the 8 x 32, slotted, hex head self-tapping screw provided. The Processor Module is typically installed in the slot to the immediate right of the Power Supply.

9. If the UT203 FID is to be part of a CCN, connect the CCN communication bus cable from the previous system element to the COMM1 RS-485 connector. Refer to Figures 3 and 4.

10. Mark the bus and element numbers on the label located on the front of the module. These numbers should be marked in decimal so they can be verified with the UT203 Owner's Module.

Diagnostic Lights:

When steadily illuminated, the LED above the OM connector indicates that the handheld UT203 Owner's Module is currently communicating with the UT203 FID.

The LED below the OM connector displays COMM1 communication status. When either the CCN communication bus or the Building Supervisor is communicating with the UT203 FID, this light should blink intermittently.

The green LED next to the power connector displays Processor status. This light should be steadily illuminated when the Power Supply is ON.

Next to the green processor status light, is a red LED that will only illuminate if the module self test fails.

Next to the COMM4 and COMM3 connectors are red LEDS that indicate communication status. The UT203 FID only uses the COMM3 connector. This LED will be illuminated when COMM3 communication is occurring.

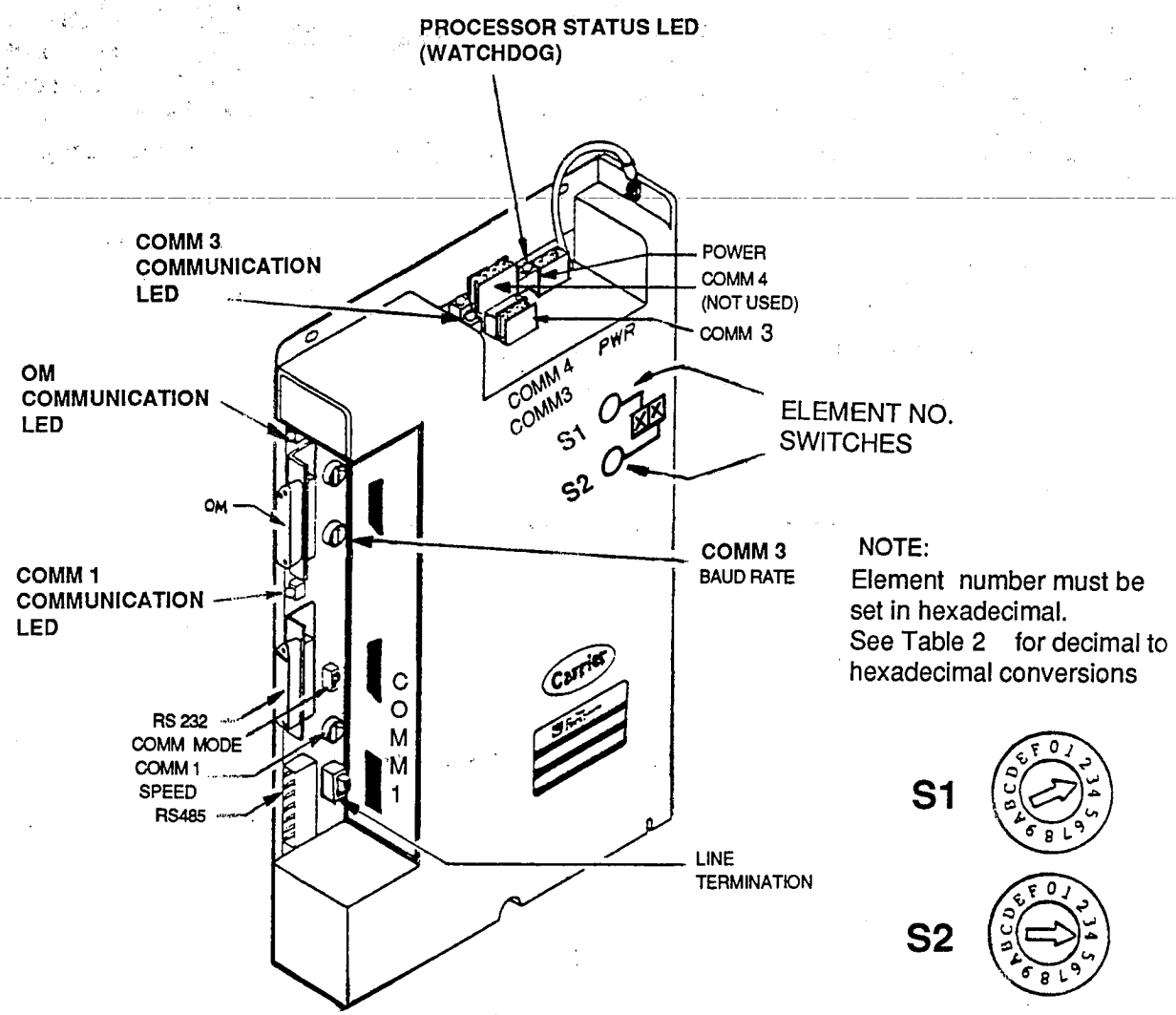


Figure 3 - UT203 FID Processor Module

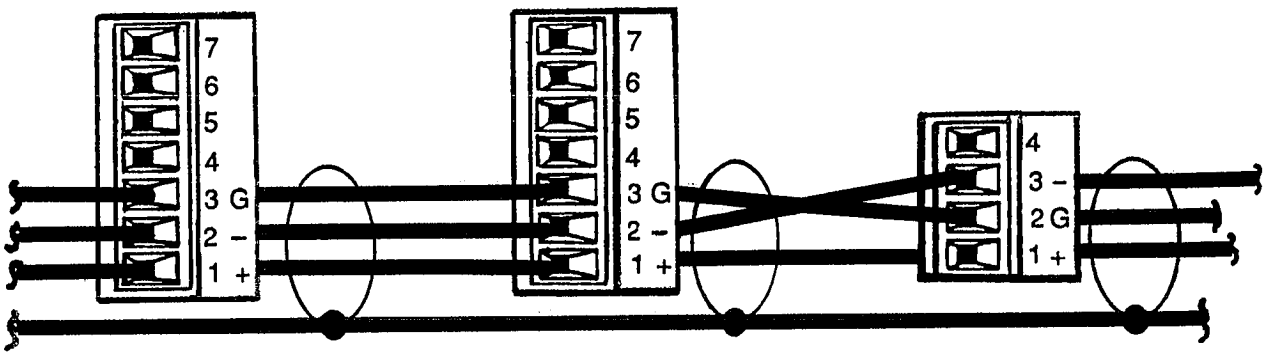


Figure 4 - CCN Communication Bus - UT203 FID Wiring

TABLE 1- Baud Rate Settings

	Position			
	1	2	3	4
Baud Rate	1200	2400	4800	9600

Switch is shown in Position 4.

Table 2 - Decimal to Hexadecimal Conversion Chart

DEC	HEX S1	S2	DEC	HEX S1	S2	DEC	HEX S1	S2	DEC	HEX S1	S2
1	0	1	61	3	D	121	7	9	181	B	5
2	0	2	62	3	E	122	7	A	182	B	6
3	0	3	63	3	F	123	7	B	183	B	7
4	0	4	64	4	0	124	7	C	184	B	8
5	0	5	65	4	1	125	7	D	185	B	9
6	0	6	66	4	2	126	7	E	186	B	A
7	0	7	67	4	3	127	7	F	187	B	B
8	0	8	68	4	4	128	8	0	188	B	C
9	0	9	69	4	5	129	8	1	189	B	D
10	0	A	70	4	6	130	8	2	190	B	E
11	0	B	71	4	7	131	8	3	191	B	F
12	0	C	72	4	8	132	8	4	192	C	0
13	0	D	73	4	9	133	8	5	193	C	1
14	0	E	74	4	A	134	8	6	194	C	2
15	0	F	75	4	B	135	8	7	195	C	3
16	1	0	76	4	C	136	8	8	196	C	4
17	1	1	77	4	D	137	8	9	197	C	5
18	1	2	78	4	E	138	8	A	198	C	6
19	1	3	79	4	F	139	8	B	199	C	7
20	1	4	80	5	0	140	8	C	200	C	8
21	1	5	81	5	1	141	8	D	201	C	9
22	1	6	82	5	2	142	8	E	202	C	A
23	1	7	83	5	3	143	8	F	203	C	B
24	1	8	84	5	4	144	9	0	204	C	C
25	1	9	85	5	5	145	9	1	205	C	D
26	1	A	86	5	6	146	9	2	206	C	E
27	1	B	87	5	7	147	9	3	207	C	F
28	1	C	88	5	8	148	9	4	208	D	0
29	1	D	89	5	9	149	9	5	209	D	1
30	1	E	90	5	A	150	9	6	210	D	2
31	1	F	91	5	B	151	9	7	211	D	3
32	2	0	92	5	C	152	9	8	212	D	4
33	2	1	93	5	D	153	9	9	213	D	5
34	2	2	94	5	E	154	9	A	214	D	6
35	2	3	95	5	F	155	9	B	215	D	7
36	2	4	96	6	0	156	9	C	216	D	8
37	2	5	97	6	1	157	9	D	217	D	9
38	2	6	98	6	2	158	9	E	218	D	A
39	2	7	99	6	3	159	9	F	219	D	B
40	2	8	100	6	4	160	A	0	220	D	C
41	2	9	101	6	5	161	A	1	221	D	D
42	2	A	102	6	6	162	A	2	222	D	E
43	2	B	103	6	7	163	A	3	223	D	F
44	2	C	104	6	8	164	A	4	224	E	0
45	2	D	105	6	9	165	A	5	225	E	1
46	2	E	106	6	A	166	A	6	226	E	2
47	2	F	107	6	B	167	A	7	227	E	3
48	3	0	108	6	C	168	A	8	228	E	4
49	3	1	109	6	D	169	A	9	229	E	5
50	3	2	110	6	E	170	A	A	230	E	6
51	3	3	111	6	F	171	A	B	231	E	7
52	3	4	112	7	0	172	A	C	232	E	8
53	3	5	113	7	1	173	A	D	233	E	9
54	3	6	114	7	2	174	A	E	234	E	A
55	3	7	115	7	3	175	A	F	235	E	B
56	3	8	116	7	4	176	B	0	236	E	C
57	3	9	117	7	5	177	B	1	237	E	D
58	3	A	118	7	6	178	B	2	238	E	E
59	3	B	119	7	7	179	B	3	239	E	F
60	3	C	120	7	8	180	B	4			

I/O Module Installation

If you are installing a CLIP Module, proceed to the section entitled **CLIP Module Installation** on page 14.

Install all I/O modules on the enclosure backplate in the slots (spaces) as specified on the UT203 FID Enclosure Layout Sheet, according to the following instructions.

note To convert 4-20 mA to 2-10 Vdc, you must add two 1000 ohm, 1/4 watt resistors in parallel across the AO pins on the field connector. Refer to Figure 5.

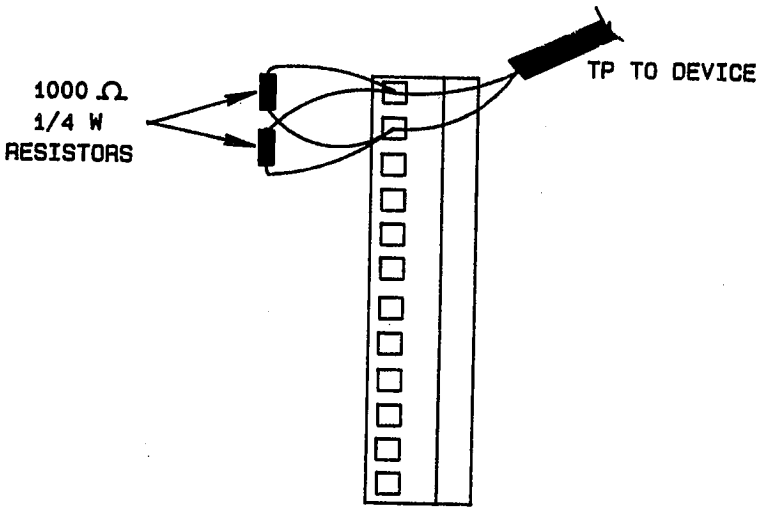


Figure 5 - Converting Analog Output to 2-10 Vdc

1. Unpack the I/O module.

2. Using a 1/8" blade screwdriver, set the 2 switches labelled *POINT NUMBER OF FIRST CHANNEL* to the appropriate position. Refer to Figure 6. Refer to the UT203 FID Module Wire Lists to determine the first point number that is being used by each module.

note Set this number in decimal. Ignore the letters on the switches. For example, to set the point number to 34, set the top switch to *3* and the bottom switch to *4*.

3. Mount the module in the enclosure by hooking the bottom of the module into the mounting rail. Leave a 1/8" space between adjacent modules to allow adequate ventilation.

4. Finish mounting the module by securing the top of the module and the green ground wire using the 8 x 32 slotted, hex head, self-tapping screw provided.

5. Write the point numbers that are used by this module on the label located on the front of the module.

6. Install all I/O modules before proceeding.

The modules are now ready for device, sensor, power supply, and processor communications wiring to be performed by the Contractor.

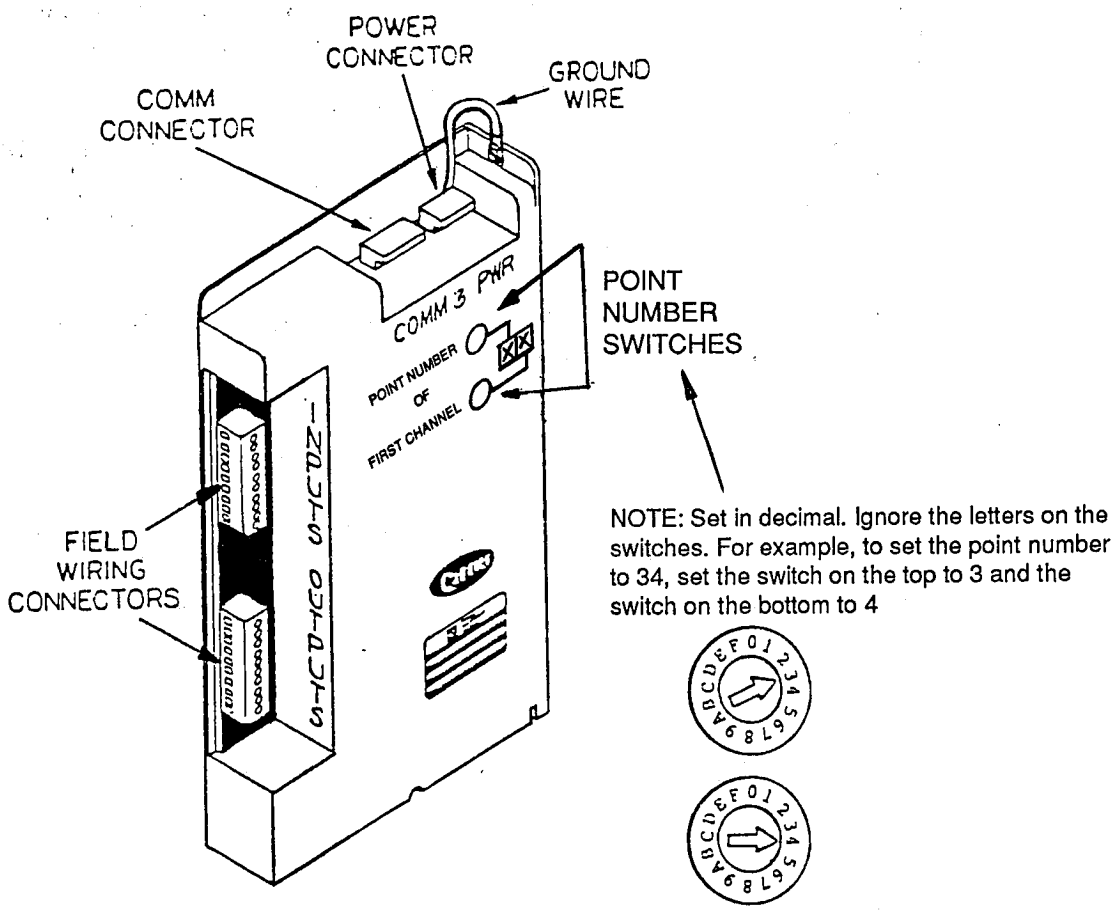


Figure 6 - I/O Module

CLIP Module Installation

caution *The air that is supplied to the CLIP Module must be free of oil, water, and foreign debris. The pneumatic system must be filtered to prevent the passage of particles larger than 5 milicrons. The reliability of the module will be seriously diminished if impure air is used.*

Install all CLIP Modules on the enclosure backplate in the slots (spaces) as specified on the UT203 FID Enclosure Layout Sheet, according to the following instructions.

1. Unpack the CLIP Module.

2. Hook the bottom of the module into the mounting rail.

3. Terminate AO wiring from the designated output module to terminal screws 3 and 4 on the CLIP Module's connector labelled *INPUTS*. Refer to Figure 7.

note Disregard polarity.

4. The CLIP Module has an integral backup EP. In the event of UT203 FID failure, this EP will cause the pneumatic actuator to revert to a backup pneumatic control system, or to fail to a preset position.

   The backup EP may be controlled by a discrete out channel in the same UT203 FID. If it is to be used, remove the backup jumper on the CLIP Module, and, disregarding polarity, terminate DO backup relay wiring to terminal screws 1 and 2 on the CLIP Module's connector labelled *INPUTS*. Refer to Figure 7.

   One discrete out channel can control up to 4 CLIP Modules. There are two ways to accomplish this:

   a. Run separate wires from the DO to each CLIP, or
   b. Wire to one CLIP and then continue to the others.

5. Finish mounting the module in the enclosure by securing the top of module along with the green ground wire using the 8 X 32 slotted, hex head, self-tapping screw provided. Leave a 1/8" space between adjacent modules to allow adequate ventilation.

6. Attach supply air tubing to the module's Main Air Port (red).

7. Attach branch air tubing to the module's Branch Air Port (white).

8. If a backup EP is used, attach backup air tubing from the existing pneumatic controller to the module's Back-up Air Port (blue).

9. Enter the point number and point description on the label on the front of the module.

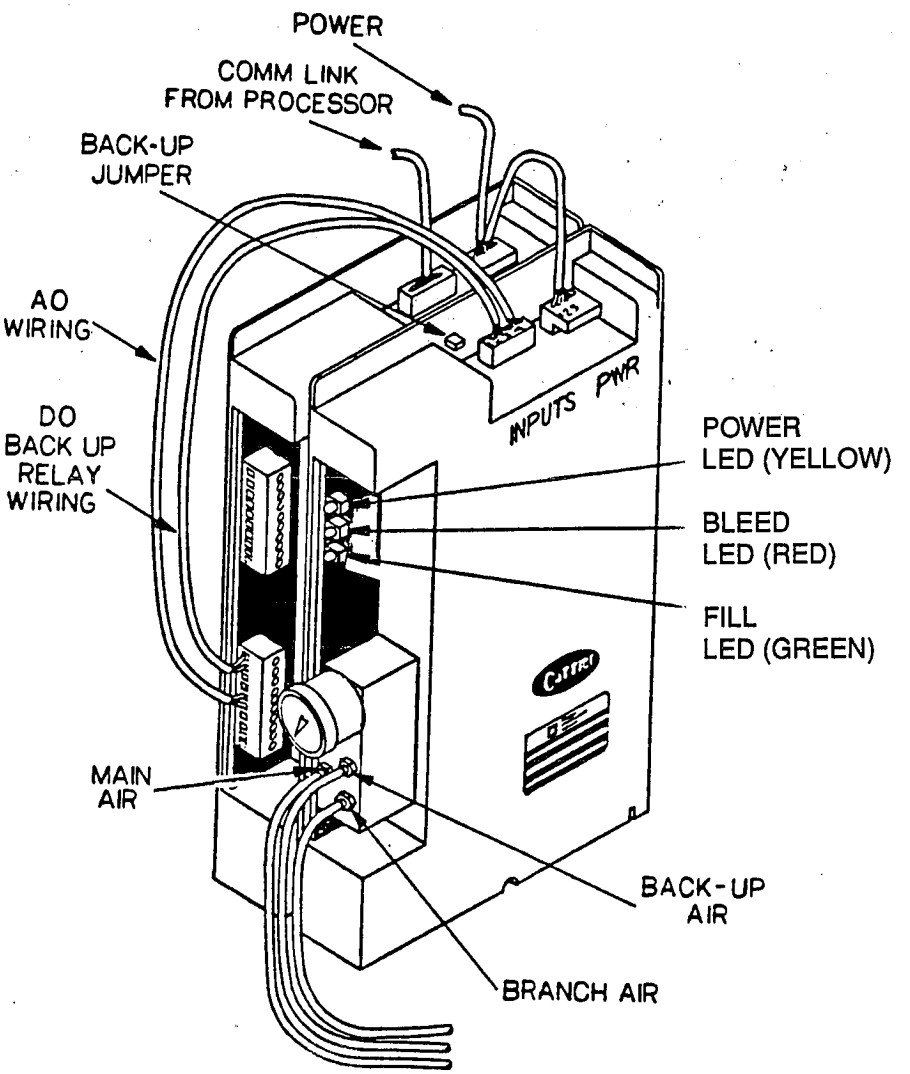
CLIP Module Operation

When the module is providing control, the Power LED (yellow) will be illuminated.

When the output pressure (branch air) is lower than the desired pressure, the fill solenoid is energized, causing the output pressure to rise. This is indicated by the illumination of the Fill LED (green). When the output pressure reaches the desired pressure, the Fill LED (green) and solenoid are both de-energized.

If the output pressure is greater than the desired pressure, the bleed solenoid and the Bleed LED (red) are energized. This bleeds the air from the controlled device to the atmosphere. Again, when the desired pressure is reached, the Bleed LED (red) and solenoid are de-energized.

When power is removed from the CLIP Module, the Power LED (yellow) is de-energized. Also, solenoid 3 is de-energized, which causes the controlled device to be connected to the pneumatic signal provided on the backup port (blue fitting on the CLIP Module).



note For the purpose of illustrating output module to CLIP Module wiring, this figure shows an output module along with the CLIP Module.

Figure 7 - CLIP Module

Module Power Wiring

Module power wiring can only be completed after all modules have been installed. Typically, installation of the modules is done by a Carrier representative, and the wiring is done by the Contractor.

Two cables exit from a Power Supply. One supplies power to the Processor; the second supplies power to the I/O modules.

To expedite the power wiring process, a pre-made daisy chain wiring harness is available from Carrier. This daisy chain can also be assembled locally by following the instructions in Figure 9 at the end of this section.

When wiring power to module(s) that are not contained in the same enclosure as the Processor and Power Supply, refer to **Section 3** of this manual. Otherwise, if modules are in same enclosure, follow the steps below:

1. Plug the power supply cable labelled *Processor* (the two pin connector) into the connector labelled *Power* on the Processor Module. Refer to Figure 8.

2. Remove and set aside the power connectors on all I/O and CLIP Modules. Refer to Figure 8. These connectors can be used to assemble the daisy chain wiring harness.

3. Connect the free ends of the wires on the daisy chain to the Power Supply's I/O power cable connector. Connect the red wire from the daisy chain to pin 1 and the white wire to pin 2.

4. Plug the connector into the power connector on the first I/O module and all remaining connectors on the daisy chain into the power connectors on the remaining I/O and CLIP Modules.

note Leave any unused connectors on the daisy chain hanging.

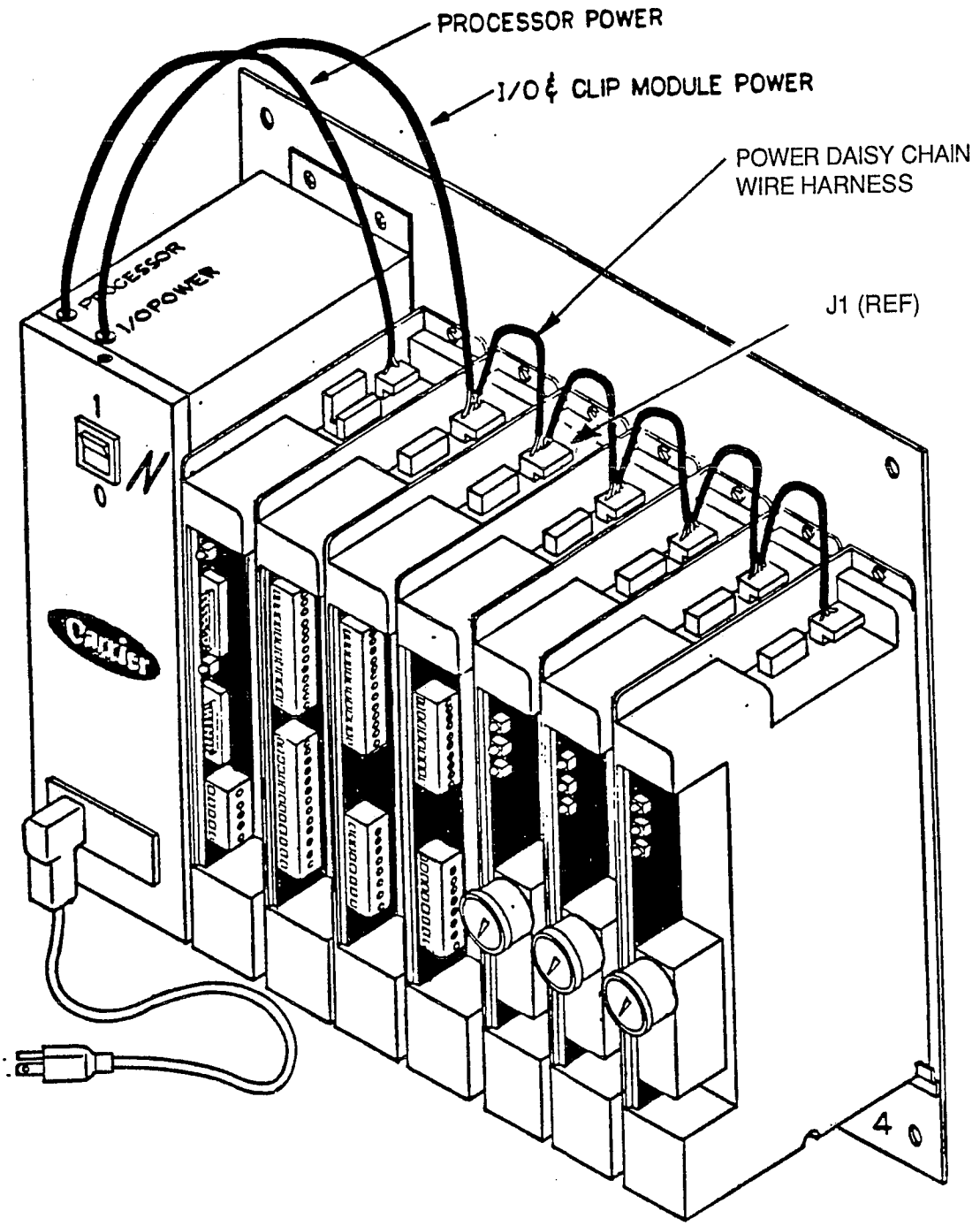
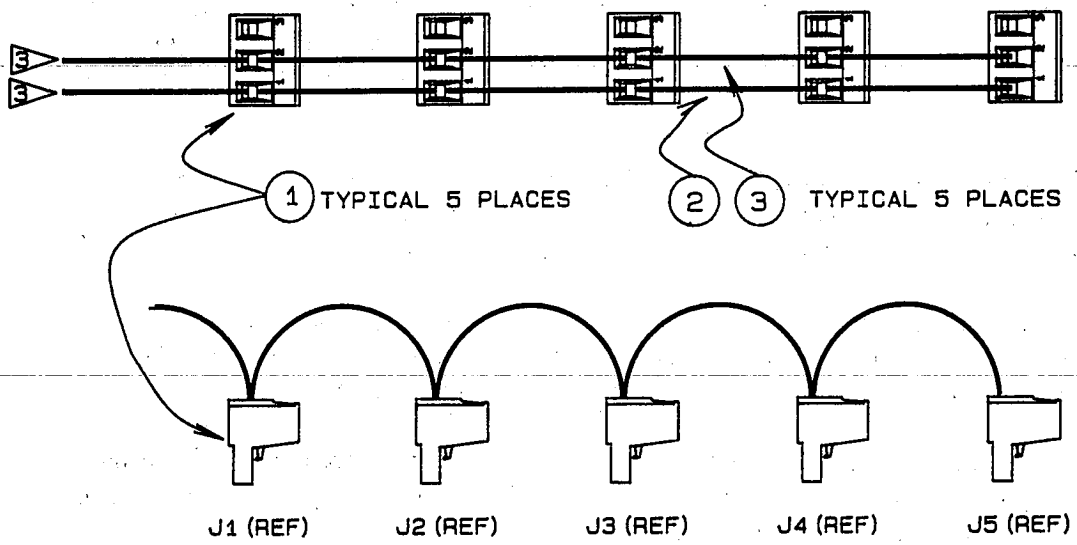
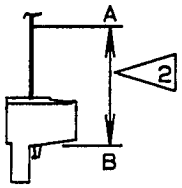


Figure 8 - Module Power Wiring





ITEM	DESCRIPTION	PART NO	REF DES	QTY
1	CONNECTOR 3 PIN GMSTB 1, 5/3 ST	CEAS120760-02	J1-J5	5
1 2	WIRE (RED) INSULATED #20 AWG 5" LENGTH	BELDEN 9919-2 OR EQUIV.		5
1 3	WIRE (WHITE) INSULATED #20 AWG 5" LENGTH	BELDEN 9919-9 OR EQUIV.		5

NOTES:

1. STRIP 1/4" INSULATION EACH END

2. MUST SUSTAIN 5 LB TENSION FROM A TO B - EACH CONDUCTOR (18 PLACES)

3. CONNECT LOOSE END TO POWER SUPPLY IN FIELD

Figure 9 - Power Wiring Daisy Chain Parts List and Assembly Drawing

Module Communication Wiring

Module communication wiring can only be completed after all modules have been installed in the UT203 FID enclosure(s). Typically, installation of the modules is done by a Carrier representative, and the wiring is done by the Contractor.

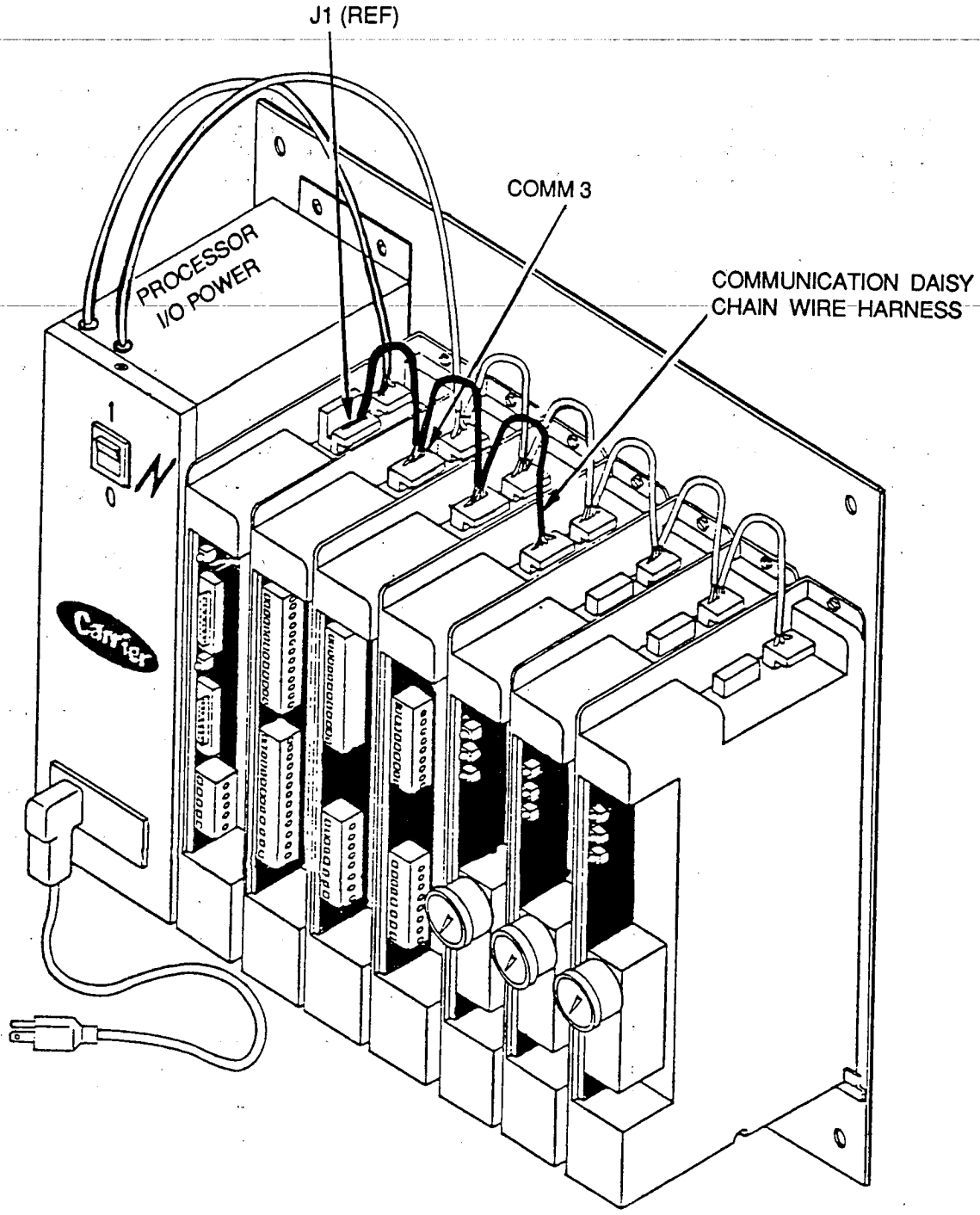
To expedite the communication wiring process, a pre-made daisy chain wiring harness is available from Carrier. This daisy chain can also be assembled locally by following the instructions in Figure 11.

When wiring to module(s) that are not contained in the same enclosure as the Processor and Power Supply, refer to **Section 3** of this manual. Otherwise, if modules are in the same enclosure, follow the steps below:

1. Remove and set aside the communication connectors on the Processor and all I/O modules. Refer to Figure 10. These connectors can be used to assemble the daisy chain wiring harness.

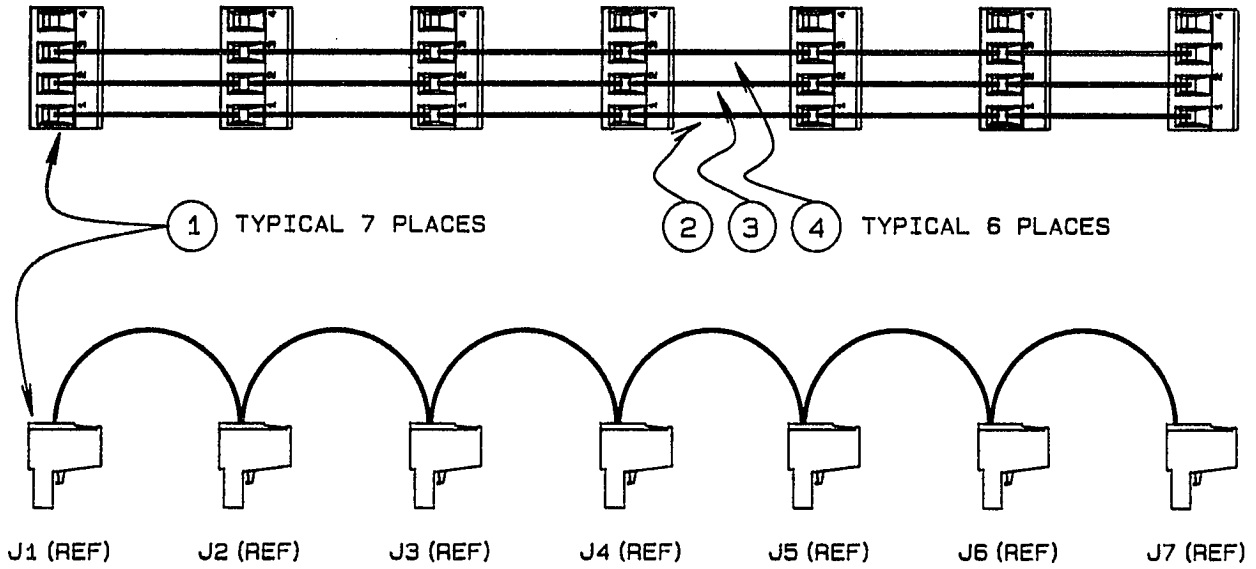
2 Beginning with the Processor Module, plug the wiring harness connectors into the COMM3 sockets on all modules except CLIP Modules.

note Leave any unused connectors on the daisy chain hanging.



note COMM link does not extend to CLIP Modules

Figure 10 - Module Communication Wiring



ITEM	DESCRIPTION	PART NO	REF DES	QTY
1	CONNECTOR 4 PIN MSTB 1, 5/4 ST	CEAS120777-01	J1-J7	7
1 2	WIRE (RED) INSULATED #20 AWG 5" LENGTH	BELDEN 9919-2 OR EQUIV.		6
1 3	WIRE (WHITE) INSULATED #20 AWG 5" LENGTH	BELDEN 9919-9 OR EQUIV.		6
1 4	WIRE (BLACK) INSULATED #20 AWG 5" LENGTH	BELDEN 9919-10 OR EQUIV.		6

NOTES:

1 STRIP 1/4" INSULATION EACH END

Figure 11 - Communication Wiring Daisy Chain Parts List and Assembly Drawing

Pre-power-up Checklist

At this point in UT203 FID start-up, the Contractor's work should be completed.

The following paragraphs describe the expected UT203 FID condition at this time.

Before continuing the start-up and installation procedures described in the remainder of the manual, take a few minutes to read through this list and make sure that each item has been completed.

1. The UT203 FID enclosure (with receptacle) is mounted securely.
2. The unit is clean and free of dirt and debris.
3. The backplate, Power Supply, and modules are mounted properly in the enclosure (as specified in the UT203 FID Enclosure Layout Sheet).
4. The UT203 FID Power Supply is connected to the 120 Vac receptacle at this time.
5. 120 Vac power is available at the dual receptacle.
6. The UT203 FID Power Supply is OFF. Switch is in the *DOWN* position.
7. Device and sensor wiring has been brought into the enclosure. All wires are marked, bundled by module and connector, and terminated to the proper module connectors as specified in the Module Wire Lists.
8. The field device connectors on all the modules are unplugged.
9. The *Point Number of First Channel* switch is set correctly on all I/O modules as specified in the Module Wire Lists.
10. The Element Number switches are set correctly (in hexadecimal) on the Processor Module as specified on the UT203 FID Enclosure Layout Sheet.
11. If a CLIP Module is used, pneumatic tubing has been brought into the enclosure. Tubing has been identified as to the device controlled and connected to the proper CLIP Module as specified in the Module Wire Lists.
12. If a CLIP Module is used, the AO channel is wired from its module to terminal screws 3 and 4 on the CLIP Module's *INPUT* connector.
13. The correct power supply cable is connected to the Processor Module.
14. The correct power supply cable is connected into the first I/O module and is wired to each subsequent I/O module — *including* CLIP Modules.

If additional enclosures and remote modules are part of this UT203 FID, they are correctly wired as such.

15. The correct communication cable is wired from the Processor Module's COMM3 connector to each subsequent I/O module — *excluding* CLIP Modules.

    If additional enclosures and remote modules are part of this UT203 FID, they are correctly wired as such.

16. If CLIP Modules are using controlled backup EPs, the backup EPs are wired to the proper DO channel(s) as specified in the Module Wire Lists and *the backup jumper on the CLIP Module is removed.*

17. The CCN Communications Bus wiring has been correctly connected to the Processor Module.

18. All controlled devices are in operating condition.

Checkout of Field Connectors

Testing Input and Output Wiring

Stray Voltage Check

Test the wiring at each connector for stray voltage. Use a volt ohmmeter (VOM) for this test.

1. Ensure that all field connectors on all modules are unplugged.

2. Place the VOM on the ac voltage scale.

3. Place the negative probe on ground (the 120 Vac receptacle cover), and the other probe on each wire terminal.

4. Check the voltage between each wire and ground. You should get *0 Vac* for all (except for externally powered 4-20 mA sensors). If voltage is present on any pin, check the field wiring before attaching the field connector to the module.

Resistance Check

Test the wiring at each connector for shorts to ground. Use a volt ohmmeter (VOM) for this test.

1. Place the VOM on the highest resistance scale.

2. Place one probe on the 120 Vac receptacle cover, and the other probe on each wire terminal.

3. Check the resistance between each wire and ground. You should get infinite resistance for all terminals.

4. Check the resistance across the two terminals to which each sensor is wired.

5. Check thermistor or RTD input resistance readings with the values shown in Table 3.

   Discrete inputs should read *0* or infinity according to the current state of the device.

   Discrete outputs should read between *200* and *800 ohms* for a KUP control relay.

   If the resistance readings are incorrect, repair the faulty wiring or sensor.

Table 3 - Temperature to Resistance Conversion

Temperature °F	Temperature °C	Resistance (ohms) 10K Thermistor	Resistance (ohms) RTD
-10	-23.0		773.1
- 5	-20.6		786.7
0	-17.8		800.2
10	-12.2		827.7
20	-6.7		855.5
30	-1.1		883.7
40	4.4	24061	912.2
45	7.2	21242	926.5
50	10.0	18791	941.1
52	11.1	17901	947.0
54	12.2	17058	952.8
56	13.3	16260	958.6
58	14.4	15504	964.5
60	15.6	14787	970.4
62	16.7	14108	976.3
64	17.8	13464	982.2
66	18.9	12852	988.1
68	20.0	12272	994.1
70	21.1	11722	1000
72	22.2	11199	1006
74	23.3	10703	1012
76	24.4	10231	1018
77	25.0	10000	1021
78	25.6	9783	1024
80	26.7	9357	1030
85	29.4	8381	1051
90	32.2	7520	1060
95	35.0	6757	1075
100	37.8	6082	1090
110	43.0	4949	1122
120	49.0	4052	1154
130	54.0	3336	1186
140	60.0	2761	1219
150	66.0	2298	1251
175	79.5	1483	1337
200	93.0	985	1423
210	99.0	843	1458
220	104.0	742	

Operational Test

The following test should now be performed to verify that the UT203 FID is operational.

1. Plug the UT203 FID Power Supply into the receptacle in the enclosure.

2. Turn UT203 FID Power Supply ON.

note

The red watchdog light on the top of each I/O module will blink, and the green light on the top of the Processor Module will illuminate.

3. Plug the UT203 Owner's Module (OM) into the OM connector on the Processor Module.

To establish communication with the UT203 FID:

4. Press START UP on the OM

5. Press ENTER

note

The LEDs on the keys of the OM will light. The OM will display *8.8.8. 8.8. 8.8.8.8.*

If *E9* appears, consult the **Troubleshooting** section of this manual. This is also a light test. Note if any lights are not lit and if any segments of the display are not ON.

6. Press CANCEL

note

The OM's display and LEDs will go blank. Communication with the FID is now established.

To enter day and clock time:

7. Press CLOCK TIME

8. Press the appropriate day of the week key

9. Input correct time

note

The UT203 FID uses a 24 hour clock. For example, if correct time is 1:50 p.m., enter *1350.*

10. Press ENTER

11. Press CANCEL

To verify that the UT203 FID has retained this data, wait five minutes, and then;

12. Press CLOCK TIME

    The OM display should read the correct time.

You may unplug the OM at this point, or proceed to the next section of this manual, entitled **Configuring the UT203 FID.**

Configuring the UT203 FID

The UT203 Field Installed Device is now ready to be configured.

note Although the eight modules provide 64 points, Points 61 through 64 are software points reserved for use with the FID's Broadcast function, Data Transfer Option, or BEST programs.

Enter the following configuration information per the *UT203 FID Owner's Module Operation Manual* and the UT203 FID's Configuration Sheets.

1. Input all time schedules.
2. Input all setpoint schedules.
3. Input all UT203 FID global configuration.
4. Input AI/DI configuration for each channel.
5. Input AO/DO configuration for each channel.

   Begin with Decision 2. Do not enter Decision 1.

6. Input Permissive Interlock configuration data for each channel.

   Begin with Decision 2. Do not enter Decision 1.

Proceed to **UT203 FID Check-out** on the following page.

UT203 FID Check-out

The final step of UT203 FID start-up is to connect the field devices to the UT203 FID and check their operation. This will require physical inspection of the devices. Commands are issued via the UT203 Owner's Module.

The following pages provide check-out procedures for input and output devices, including a detailed procedure for checking Analog Control Types 1 through 9.

Connection and Check-out of Input Devices

1. Input Decision 1 for each input channel used.
2. Plug field connector into the module.
3. Display each input channel.
4. Check the accuracy of each input by comparing the data displayed on the OM with the actual temperature, status, pressure, etc. at the input device.

note

For AI points, verify the physical location of the sensor. Is the discharge sensor downstream of the coil? Is the space sensor in the correct space? Is the pressure sensor in a non-turbulant area, etc.

If any input does not check-out properly, verify its configuration decisions.

Inputs that are reading almost but not quite accurately, can be trimmed by entering the correct reading for the input in Configuration Decision 8.

Inaccurate inputs must be corrected or forced and disconnected from field connectors before proceeding to connect output devices. If a sensor is disconnected, enter a forced value in its place before attempting to check associated output devices.

Connection of Output Devices

1. Input Decision 1 for each output channel used.
2. Force each output to a safe position.

note

This is recommended because the UT203 FID will take control of the output devices as soon as the field connectors are plugged into the module. This safe position will ensure an orderly check-out and not disrupt normal building operation.

3. Plug field connectors into the module.

To Check Operation of Discrete Outputs

1. Display each discrete output.
2. Force the device ON (or OFF) and verify the operation of the device.
3. Force the device OFF (or ON) and verify the operation of the device.
4. Remove the force as each discrete out passes check-out. Observe proper algorithm control of each point before proceeding.

To Check Operation of Analog Outputs (AO Types 1 through 9 only!)

Reminder

To convert 4-20 mA to 2-10 Vdc, add two 1000 ohm, 1/4 watt resistors in parallel across the AO pins on the field connector.

1. Verify that all required decisions for the analog out have been entered.
2. Verify that appropriate energy sources are activated; i.e. air, steam, chilled water, etc.
3. Enable the backup relay, if applicable.
4. Force the output actuator (damper valve, vane, etc.) over its range to determine actual psi for open and closed position and to determine if the balance point corresponds to the standard psi for the device type. Refer to Table 4 for standard values. Adjust using Decision 51 if necessary.

note

While checking the spring range, verify that the controlled device (damper, valve, actuator) moves smoothly and without excessive slop. Sticky/sloppy actuators will result in unstable operation. Set pilot positioners if necessary.

Table 4 - Standard Center PSI Outputs

Decision 51

Type 1 - Shared Transducer:	0 = Standard Center Output of Type 2 or Type 3
Type 2 - Cooling Coil	0 = 12 psi
Type 3 - Heating Coil	0 = 6 psi
Type 4 - Duct Reset	0 = 6 psi
Type 5 - Humidification	0 = 6 psi
Type 6 - Inlet Guide Vane	0 = 9 psi
Type 7 - Water Reset	0 = 9 psi
Type 8 - Multizone Damper	0 = 9 psi
Type 9 - Mixed Air Damper	0 = 9 psi

5. Verify that the system is in an occupied time period and has not cycled off during the checkout.

note

If necessary, enter a false time into the FID so it will be in the occupied mode and the algorithm will run. Remember to correct the time when finished with checkout.

6. Verify that the DI status point entered in Decision 20 is ON. First do a quick check to see if the control loop is running. This is done by looking at Decision 66, the Master Loop Reference Value. If the value is *-10*, then the loop has never run and you should recheck the configuration for that AO point.

7. Using the OM, force the submaster reference to a number above or below the submaster sensor reading and verify that the psi and actuator respond appropriately. Forcing the submaster reference is done by changing two maintenance decisions for the point you are testing. First enter a *16* in Decision 60; this tells the FID to use the submaster reference value that you enter. Next, enter your submaster reference value in Decision 65.

note

If the system oscillates every few seconds around the forced value, then lower the Submaster Gain (Decision 37) by small amounts until the psi is stable.

Do not be alarmed if the submaster sensor stabilizes at a number greater or less than the forced value. This is called submaster *droop* and is normal.

If the actuator drives in the wrong direction, go to Decision 37 (Submaster Gain Multiplier) and enter a -1.0 by keying in *910*. This reverses the gain.

8. Using the OM, force the submaster reference to the exact same value as the submaster sensor. Use Decision 65 as in Step 3. It may help to force the submaster sensor to a stable value.

note

The actuator should go to its balance position and the psi should equal the center value (Decision 51).

When you force, the actual readings will be varying, so it may take a few tries to get exact readings.

If the valve does not go to the balance point when the submaster reference equals the submaster sensor, the wrong value was entered into Decision 51. Go back to Step 4 of the AO Operational Checkout.

9. When the above has been accomplished, remove the submaster forces by entering *0* in Decision 60. The submaster loop should now be in control.

10. Using the OM, read all master loop sensors to see if they are within the desired setpoints.

note

The first master loop sensor is the AI point entered in Decision 23. Decision 24 of that AI point provides the next AI point to be referenced. Decision 42 of the AO point provides the total number of master loop sensors.

11. If values are within setpoint limits, force the sensor points high or low (causing the system to demand cooling or heating or increased duct pressure, etc.), and verify that the system requests the proper response.

    A small error in the master loop typically causes a large response in the inner loop. Don't be surprised if the loops get clamped.

    This step is used solely to verify if the device goes in the right direction.

    If the system goes in the wrong direction, a mistake was probably made in the submaster loop (Decision 37).

    The master loop should almost always have a positive gain.

12. Remove all forces from the sensors and verify that the system returns to normal operation.

note

If there is a load on the system, observe normal dynamic control for 10 to 20 minutes to verify that the master loop is stable.

If the psi output is still swinging between the minimum and maximum after 10 minutes, lower the master loop gain by *0.5*.

If the system doesn't seem to be responsive (i.e., large error, small output), raise the master loop gain by *0.5*.

Continue to observe and repeat until stable responsive operation is verified.

Troubleshooting

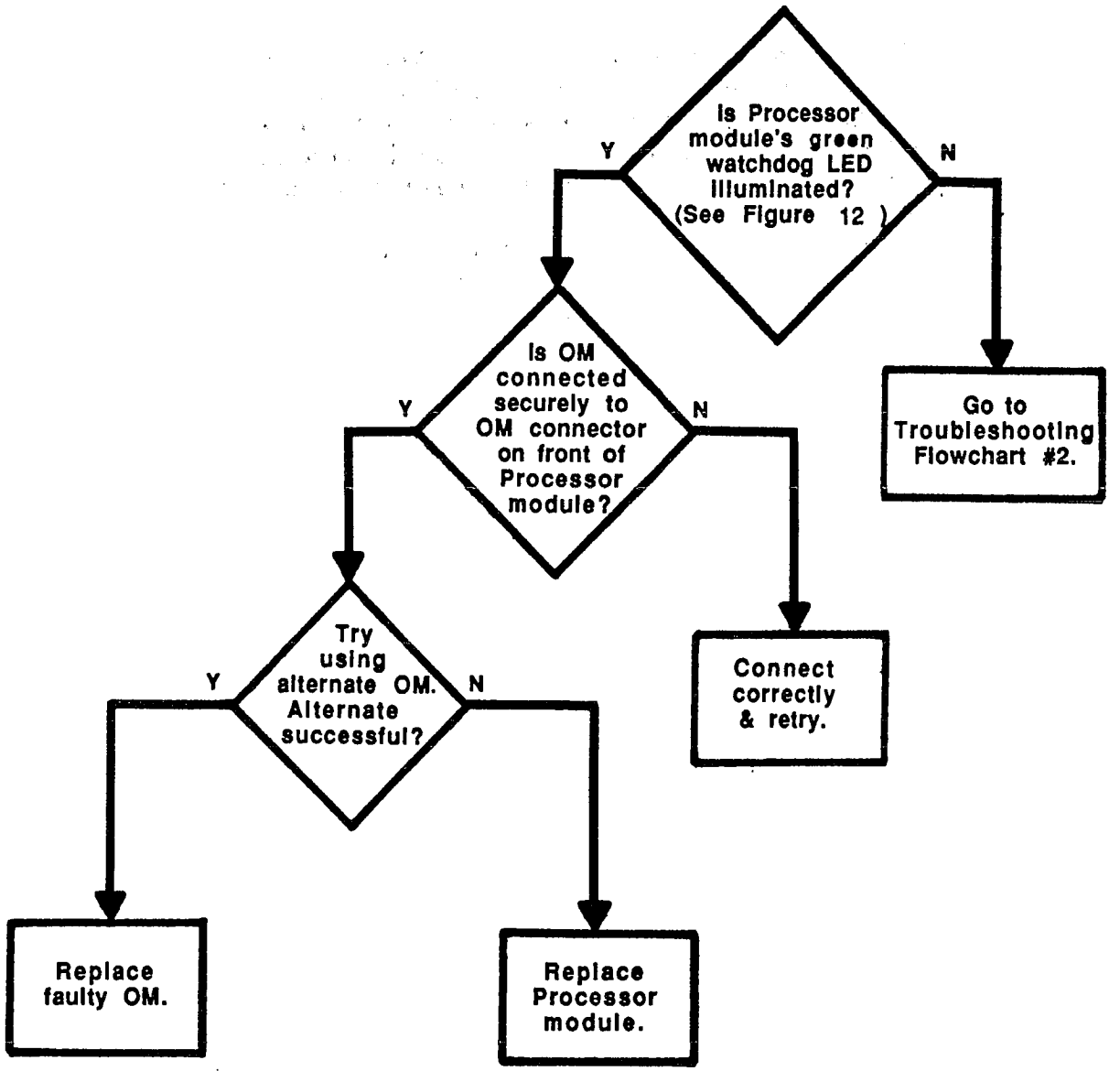
This section is provided to help the service technician diagnose and repair some basic problems that can occur during UT203 FID start-up.

The problems addressed in this section are:

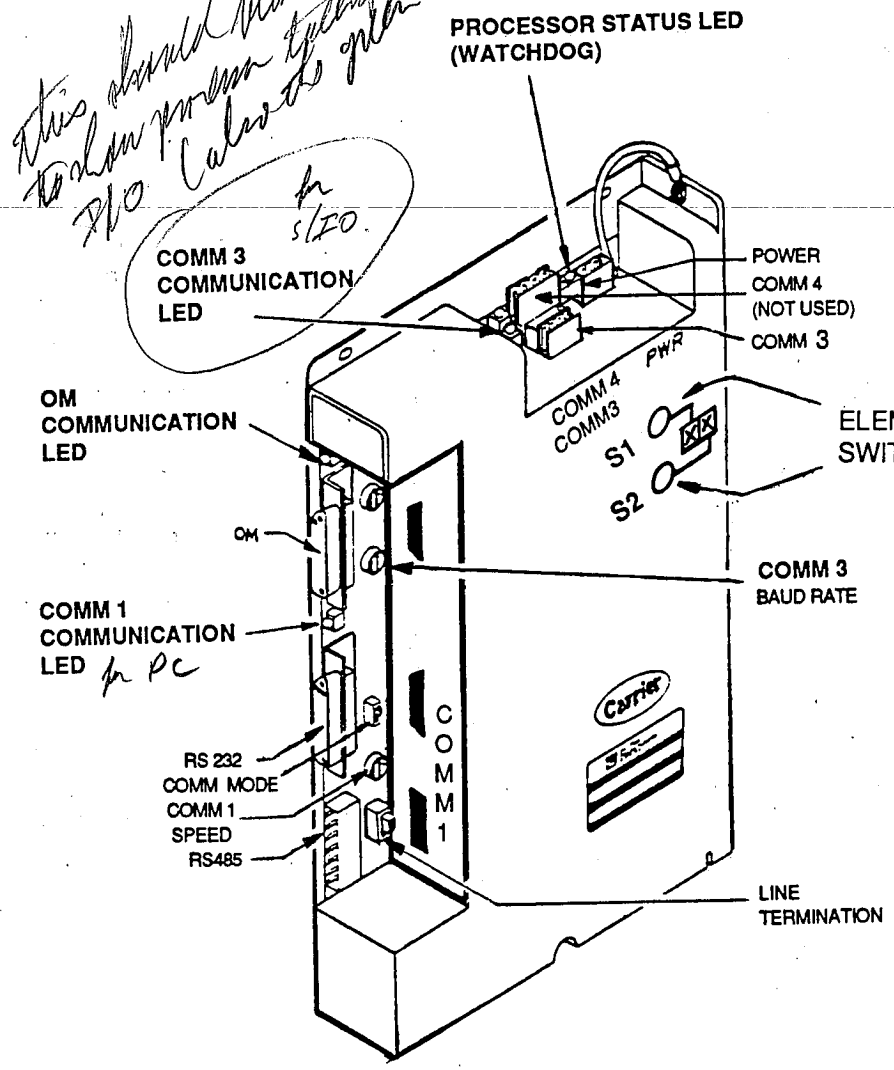
1. UT203 Owner's Module will not sign on to UT203 FID
2. Green Processor Watchdog LED is not illuminated
3. Display of inputs does not correspond to actual values.
4. All inputs and outputs on one I/O module do not work
5 All inputs and outputs on more than one I/O module (but not all) do not work
6. All inputs and outputs on all I/O modules do not work
7. One CLIP analog output does not work
8. All CLIP analog outputs do not work

TROUBLESHOOTING FLOWCHART # 1

OM Will Not Sign On To UT203 FID
(No display appears when attempting to establish communication.)



note If an error code displays on the OM display, refer to Appendix B.



NOTE:
Element number must be set in hexadecimal.
See Table 2 for decimal to hexadecimal conversions

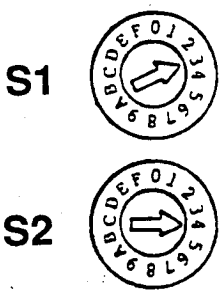
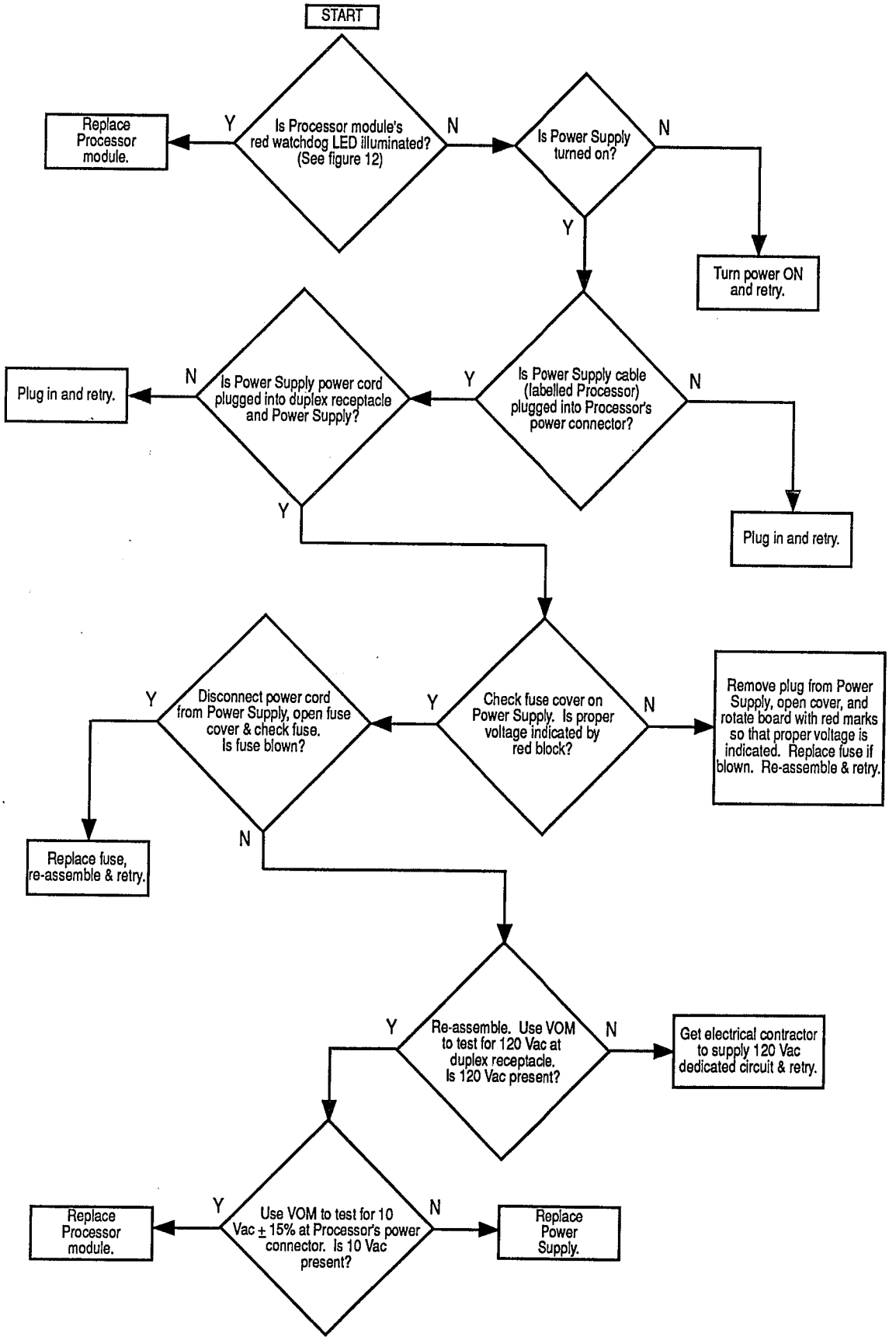
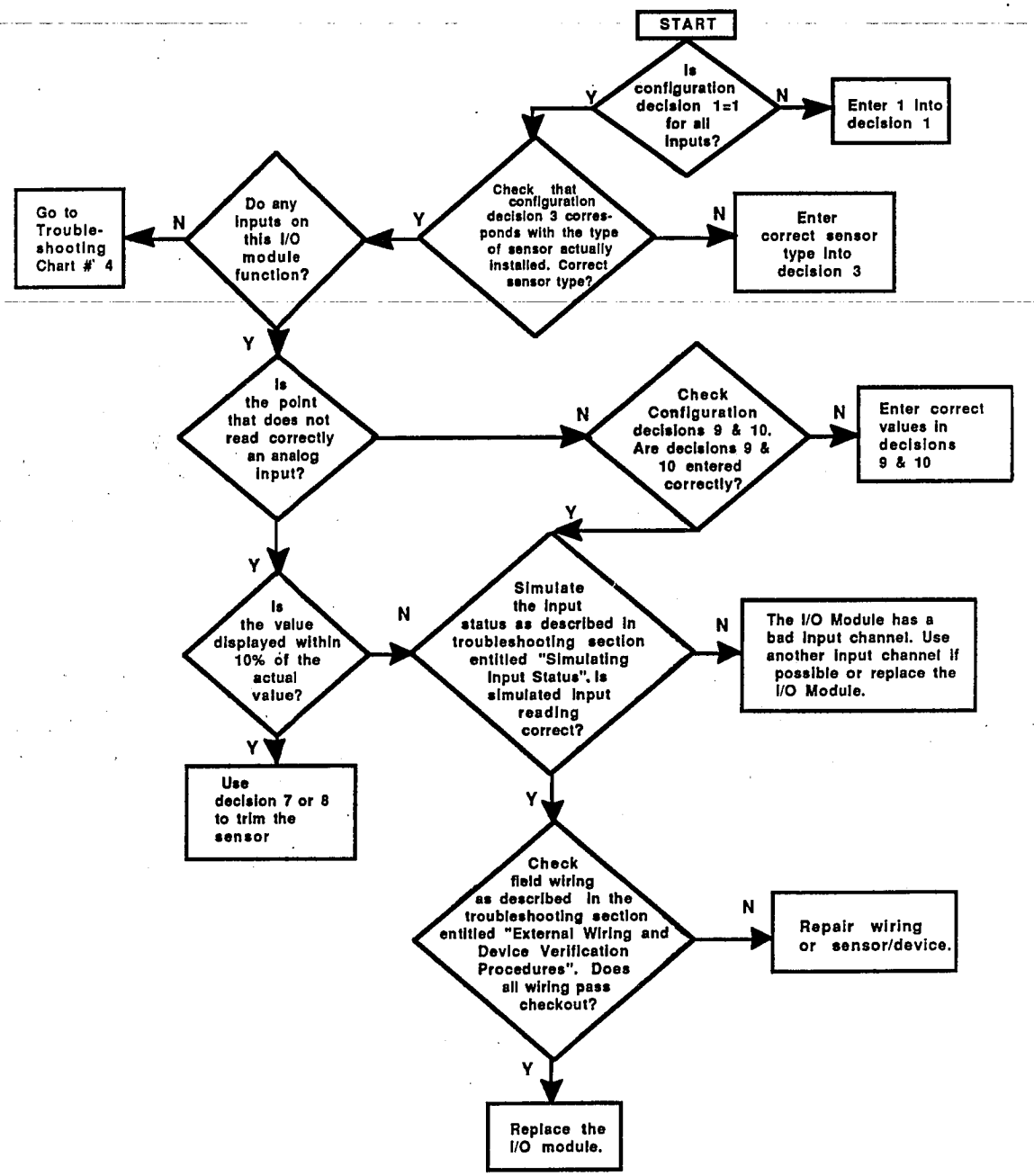


Figure 12 - UT203 FID Processor Module

Troubleshooting Flowchart #2
Processor Module's Green Watchdog LED is Not Illuminated



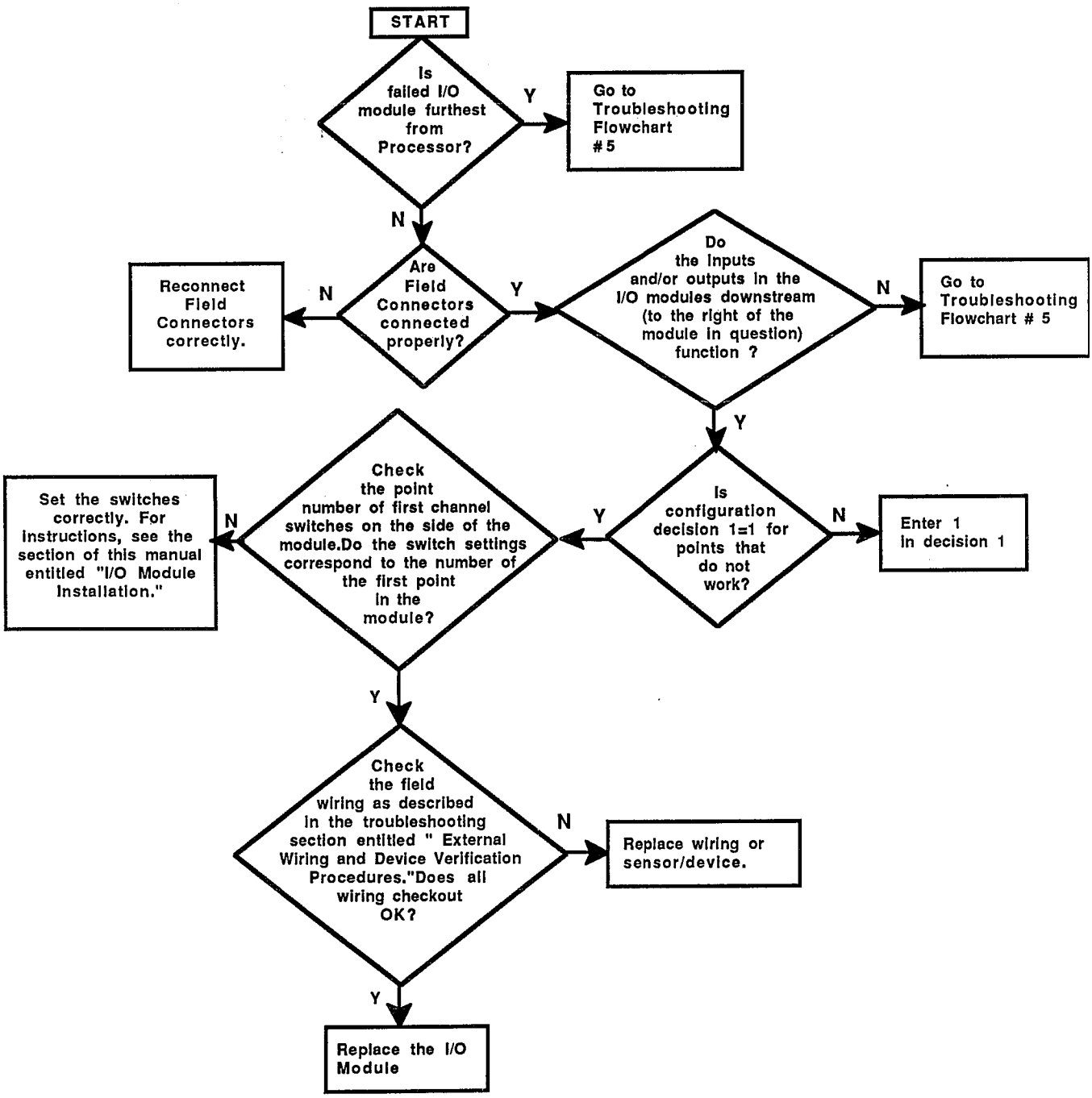
TROUBLESHOOTING FLOWCHART # 3
Display of Inputs does not Correspond to Actual Values



TROUBLESHOOTING FLOWCHART #4

All Inputs and Outputs On Only one I/O Module Do Not Function

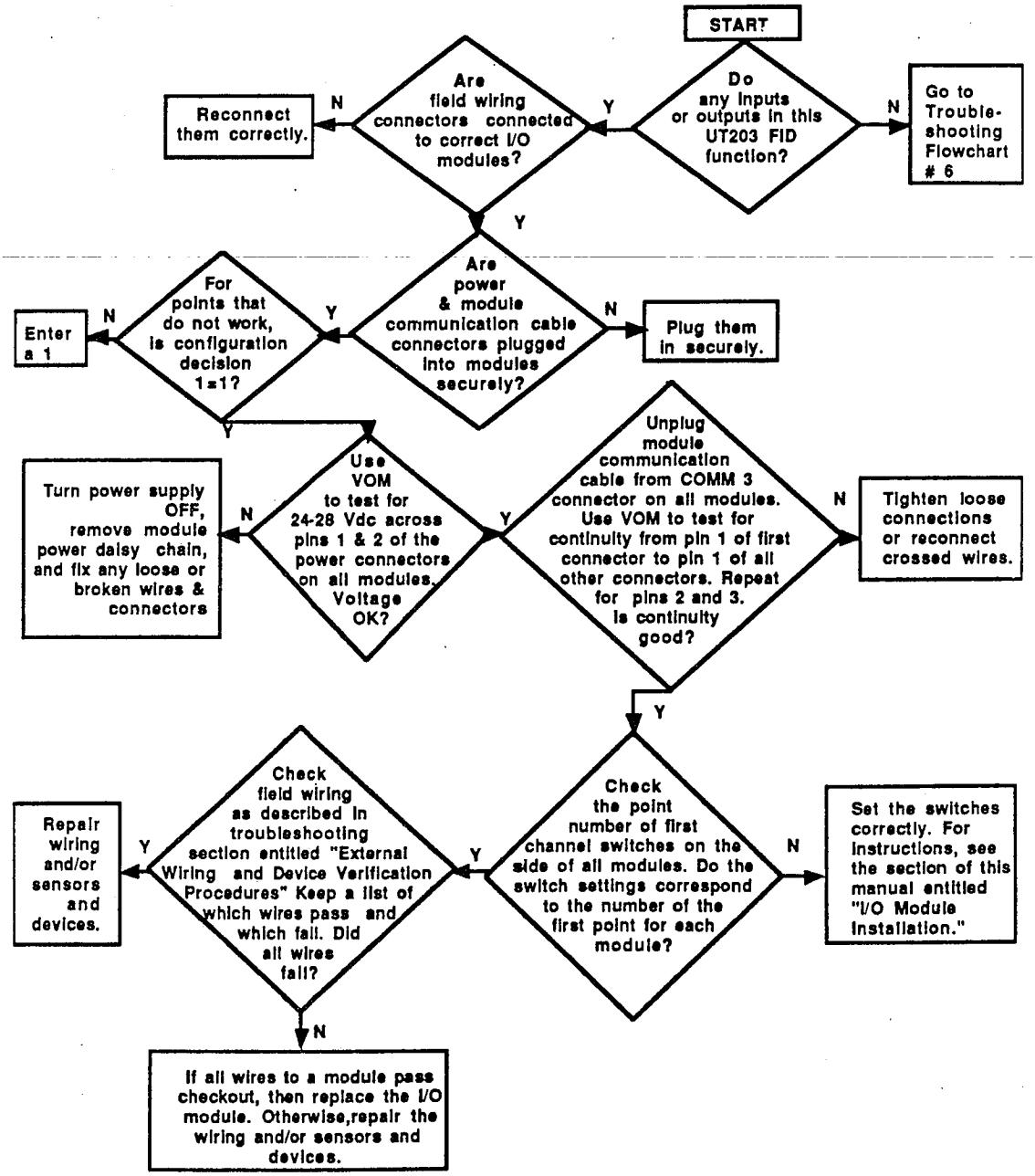
(OM Display does not correspond to actual values)



TROUBLESHOOTING FLOWCHART # 5

All Inputs and Outputs On More Than One - But Not All I/O Modules Do Not Function

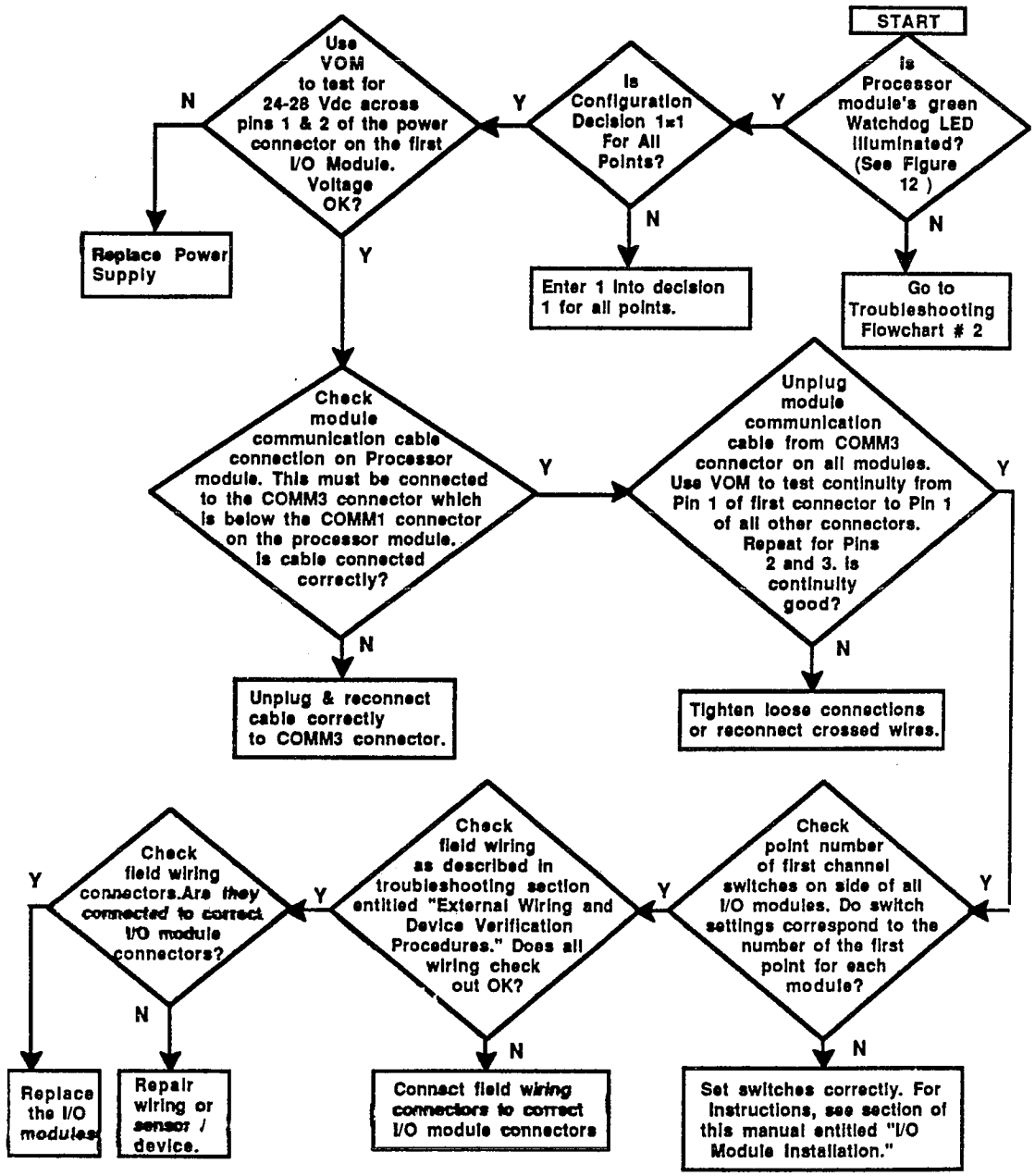
(Om display does not correspond to actual values.)



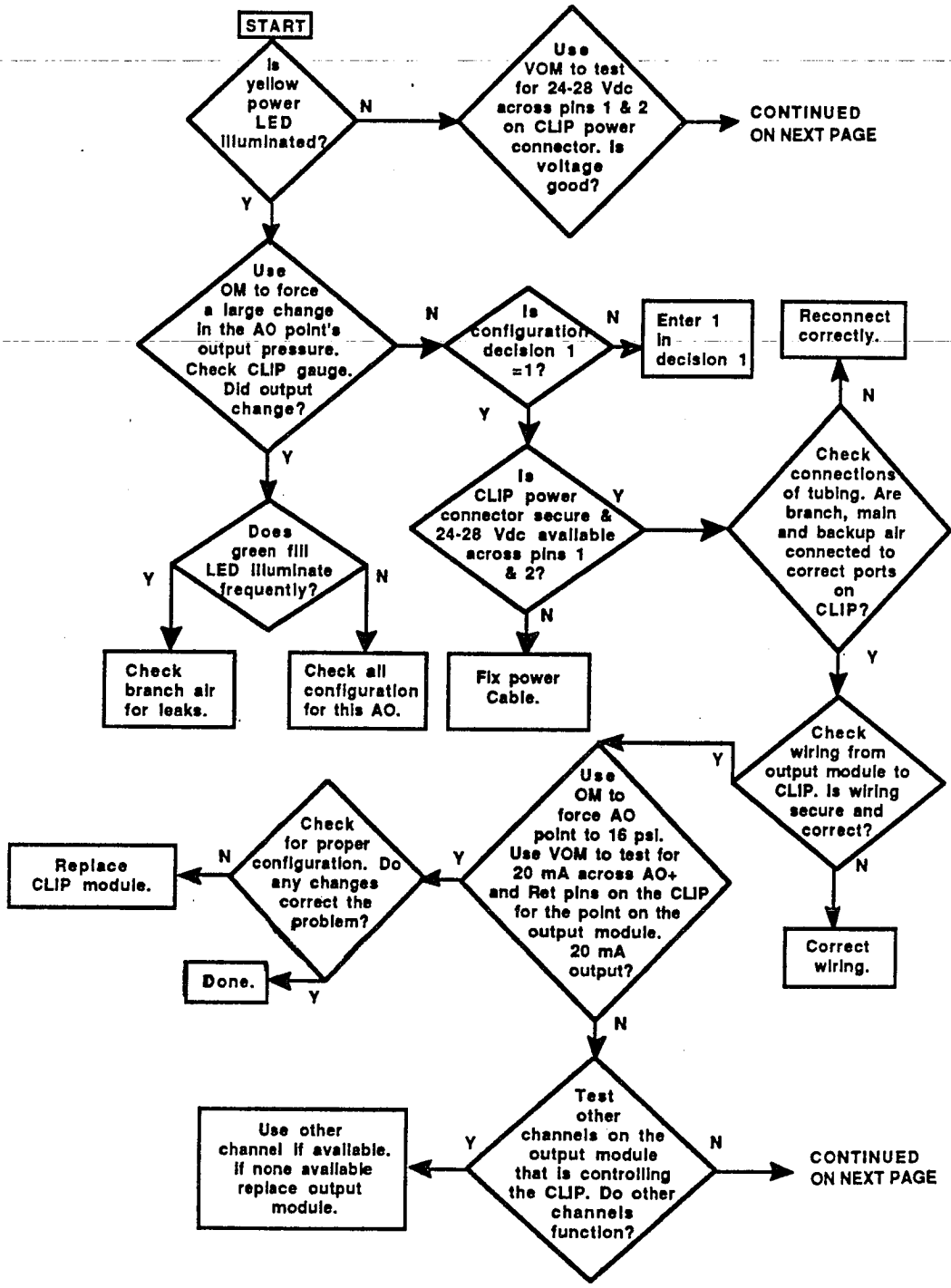
TROUBLESHOOTING FLOWCHART # 6

All Inputs and Outputs On All Modules Do Not Function

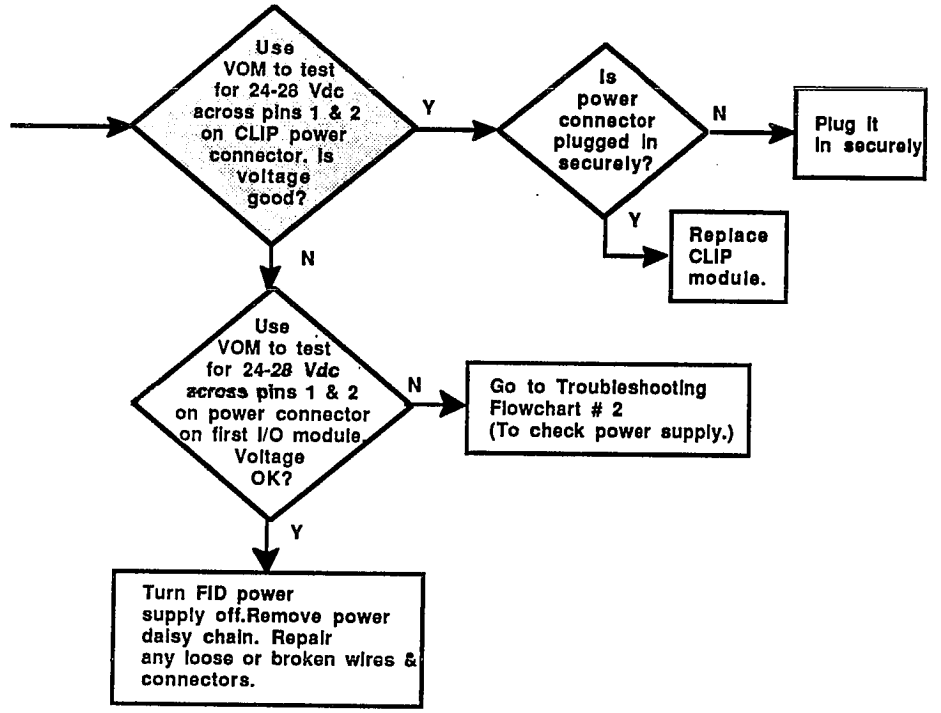
(OM display does not correspond to actual values.)

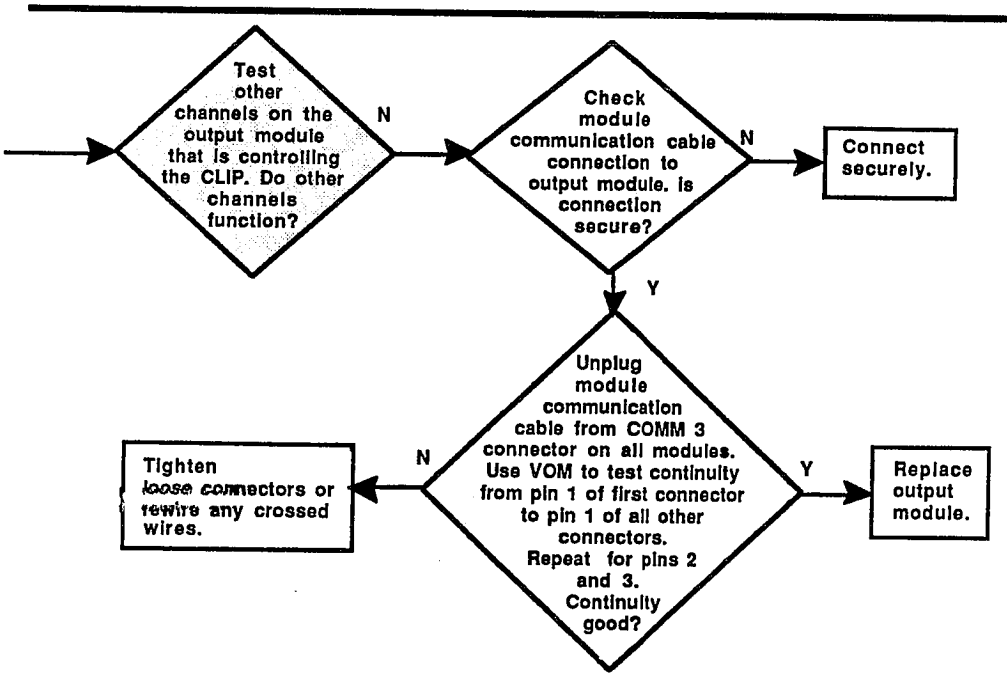


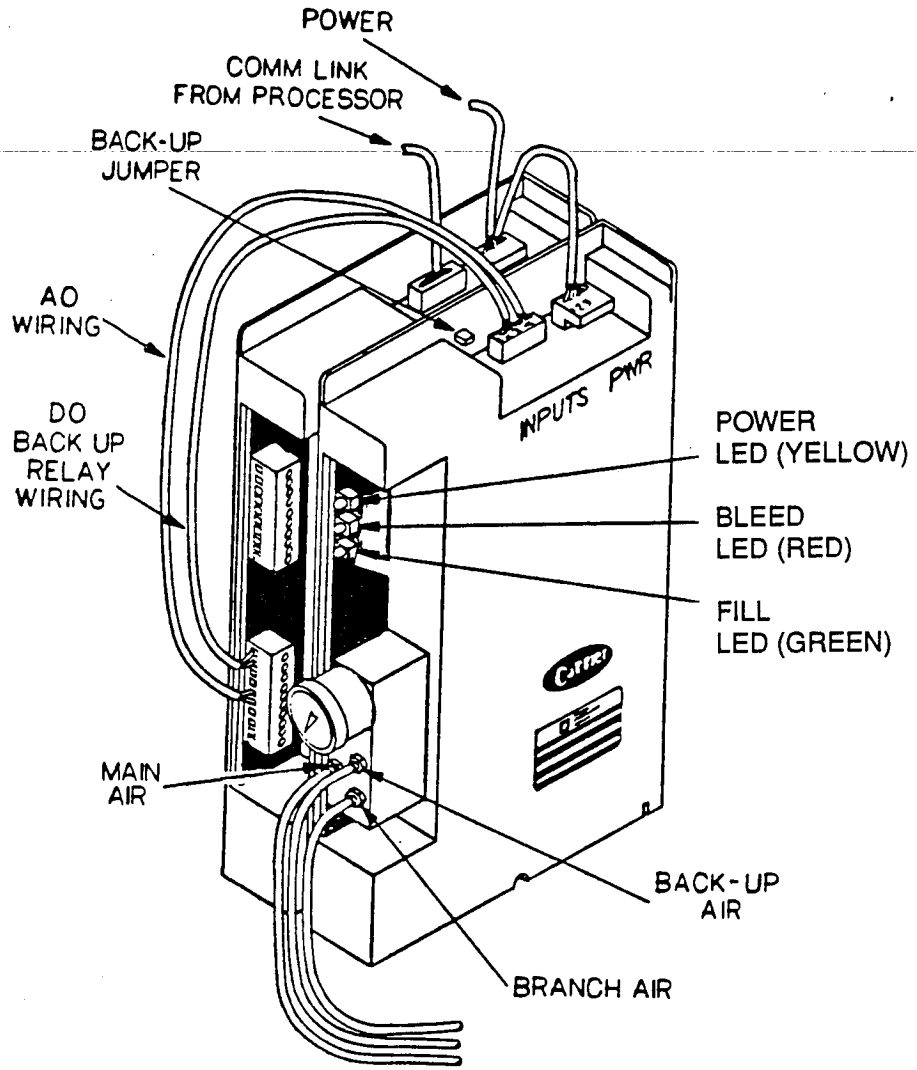
TROUBLESHOOTING FLOWCHART # 7
One CLIP Analog Output Does Not Control Properly



TROUBLESHOOTING FLOWCHART # 7
(CONTINUED FROM PREVIOUS PAGE)





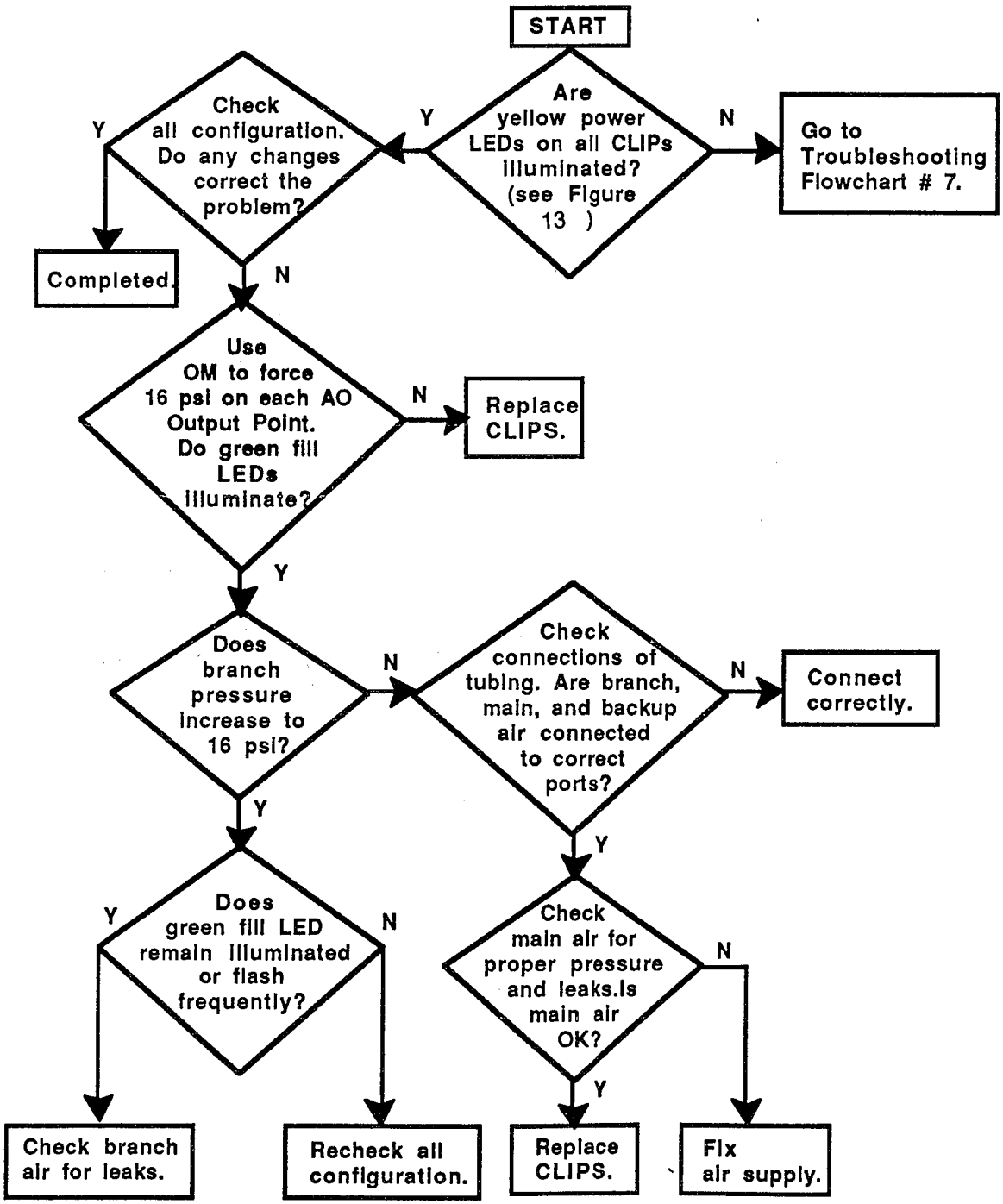


note For the purpose of illustrating output module to CLIP Module wiring, this figure shows an output module along with the CLIP Module.

Figure 13 - UT203 FID CLIP Module

TROUBLESHOOTING FLOWCHART # 8

<u>All CLIP Analog Outputs Do Not Control Properly.</u>



External Wiring and Device Verification Procedures

External Wiring Verification Procedure

1. Turn UT203 FID power OFF.

2. Remove field wiring connector from the I/O module.

3. Using the wire list as a guide, locate the wiring pair associated with the point to be verified.

4. For the same point, go to the sensor or controlling relay and remove the wiring pair from the device terminals. Short the two wires together.

5. Return to the UT203 FID and use a VOM to measure the resistance across the wiring pair described in Step 3 above. The reading should be less than 5 ohms.

6. Go to the sensor or controlling relay and remove the short described in Step 4 above. Do not reconnect the wires to the sensor at this time.

7. Return to the UT203 FID and again use a VOM to measure the resistance across the wiring pair. The reading should measure an open, or infinite ohms.

8. If either of the resistances measured in Steps 5 and 7 above was incorrect, a problem exists in the wiring. Replace the wiring pair, or repair if practical.

9. If both measurements were correct, continue on with **External Device Verification Procedure.**

External Device Verification Procedure

1. After you have determined that the wiring between the UT203 FID and the sensor or controlling relay is correct, you should then determine whether the device itself is functional.

2. If the device in question is a temperature sensor, verify that it is properly mounted at the correct location as described in the installation drawings. Be sure that space sensors are not located near coffee pots, copying machines, or other sources of heat or cold.

3. If the device in question is a thermistor, a RTD, or a DO relay coil, use a VOM to measure the resistance across the device terminals. Compare this measurement to Table 5. If the measurement is correct, reconnect all wiring between the device and the UT203 FID. If this measurement is incorrect, the failed device should be replaced and all wiring between the device and UT203 FID should be reconnected.

4. If the device in question is a 4-20 mA type, i.e. the Differential Pressure Transducers P-7 or P-33, there is no simple device verification procedure. In this case the device is assumed to be functional until all device wiring, UT203 FID wiring, configuration decisions, and setpoint schedules are verified as correct. The 4-20 mA device should be replaced *only* after all other parameters have been checked thoroughly.

5. If the device in question is a Motor Current Transducer CT-1, the verification procedure is as follows:

warning

Before servicing this or any device inside a motor control panel, be sure high voltage supply is disconnected.

   a. Verify Motor Current Transducer CT-1 is installed and properly wired in the correct part of the starter circuit as described in the installation drawings.

   b. Verify wiring from the UT203 FID to CT-1 by following the External Wiring Verification Procedure described above. Then, reconnect wiring pair at the device terminals.

   c. Reconnect high voltage supply to the motor control panel.

   d. Return to the UT203 FID. The field wiring connector should *not* be connected to the I/O module at this time.

   e. Manually run the machine up to full load. Use a VOM to measure the voltage across the device wiring pair. The reading should measure *2* to *5 Vdc*. If this voltage is incorrect, replace Motor Current Transducer CT-1.

6. After external wiring and devices have been determined to be functional, reconnect the field wiring connector to its I/O module.

Simulating Input Status

To determine whether a problem is within the UT203 FID or in the external wiring or sensor, it is helpful to simulate the input to provide a known steady input to the controller. This test can be done for the thermistor, RTD, and discrete input types. 4-20 mA inputs cannot be simulated in this manner.

1. Turn the UT203 FID power OFF.

2. Use the wire list as a guide to locate the terminal numbers for the wire to the input point.

3. Use a small blade flathead screwdriver to remove the wire pair to the input point.

4. Select a comparable substitute for the input. For example:

   - A 1K ohm resistor can be substituted for a RTD type sensor. It will provide a reading of approximately 70°F.
   - A 10K ohm resistor can be substituted for a thermistor type sensor. It will provide a reading of approximately 77°F.

note

Due to manufacturing tolerances, the actual resistances may vary, and thus temperature readings may vary as well. To get a more precise reading, measure the resistance of the resistor and use that value to check for temperature in Table 5 on page 48.

   - A short piece of #20 AWG wire can be substituted for a discrete input to provide an ON (or OFF) reading.

5. Insert the leads of the substitute into the two terminals for the input points. Tighten the terminal screws to insure good electrical contact.

6. Turn the UT203 FID power ON.

7. Read the status of the input point with the OM. Correct readings are:

   - For thermistor and RTD substitute readings, refer to Table 5.
   - ON for a discrete input with straight logic (*0* in Decision 10), or OFF for inverted logic (*1* in Decision 10).

Table 5 - Temperature to Resistance Conversion

Temperature °F	Temperature °C	Resistance (ohms) 10K Thermistor	Resistance (ohms) RTD
-10	-23.0		773.1
- 5	-20.6		786.7
0	-17.8		800.2
10	-12.2		827.7
20	-6.7		855.5
30	-1.1		883.7
40	4.4	24061	912.2
45	7.2	21242	926.5
50	10.0	18791	941.1
52	11.1	17901	947.0
54	12.2	17058	952.8
56	13.3	16260	958.6
58	14.4	15504	964.5
60	15.6	14787	970.4
62	16.7	14108	976.3
64	17.8	13464	982.2
66	18.9	12852	988.1
68	20.0	12272	994.1
70	21.1	11722	1000
72	22.2	11199	1006
74	23.3	10703	1012
76	24.4	10231	1018
77	25.0	10000	1021
78	25.6	9783	1024
80	26.7	9357	1030
85	29.4	8381	1051
90	32.2	7520	1060
95	35.0	6757	1075
100	37.8	6082	1090
110	43.0	4949	1122
120	49.0	4052	1154
130	54.0	3336	1186
140	60.0	2761	1219
150	66.0	2298	1251
175	79.5	1483	1337
200	93.0	985	1423
210	99.0	843	1458
220	104.0	742	

Remote Modules

Section 3

Remote Modules - Introduction

A remote module is any module that is not contained in the same enclosure as the UT203 FID Processor and Power Supply. Remote modules may be contained in a separate enclosure or, when safety codes allow, mounted on a wall without an enclosure.

Remote modules may be powered in either of two ways:

1. By the UT203 FID's Power Supply.
2. By a separate Power Supply mounted locally with the remote module.

There is only one way to run communication wiring, regardless of how the module is powered. Instructions for communication wiring can be found in **Remote Module Communication Wiring** located at the end of of this section. *The communication wiring must not exceed 1000 feet between the module and the Processor Module.*

Remote Modules - Powered by UT203 FID Power Supply

Remote modules can be powered by the UT203 FID's Power Supply.

There are a few limitations to consider when using this method. Remote module mounting is subject to the following rules:

#1 The sum of the length of power wire from the Power Supply to each remote module must be less than 2250 feet.

For example, if one remote module is mounted at 500 feet and a second remote module is at 800 feet, the total distance is 1300 feet.

#2 The Power Supply provides up to 4A of power at 28 Vdc for use by I/O and CLIP Modules.

note

Each I/O module uses 0.5A and each CLIP Module uses 0.25A. Thus, the Power Supply can power up to 8 I/O modules. (In this calculation, the CLIP is equal to 1/2 a module and the Processor Module is not counted.)

#3 The terminating shields on the power cables going to remote modules are described on page 51.

Let's take a look at some examples.

Example 1: A UT203 FID has a Power Supply, a Processor Module, and four I/O modules mounted in the same enclosure as the Power Supply.

Question: *Can you add three I/O modules remotely mounted 1500 feet away?*

Answer: *No,* the maximum module communication wire distance between the Processor Module and the furthest remote module must be less than 1000 feet.

Solution: Another UT203 FID including enclosure, Power Supply, Processor, and the three I/O modules should be installed closer to the equipment to be controlled and monitored.

Example 2: A UT203 FID has a Power Supply, a Processor Module, and four I/O modules mounted in the same enclosure as the Power Supply.

Question: *Can you add three I/O modules remotely mounted 800 feet away?*

Answer: *No,* referring to Rule #1, the sum of the distances of power wire from the Power Supply to each remote module must be less than 2250 feet. In this case, the total distance in feet is 2400 feet (3 modules @ 800 feet).

Solution: These I/O modules should be powered locally, either with individual power supplies or with a UT203 FID Power Supply.

Example 3: A UT203 FID has a Power Supply, a Processor Module, and four I/O modules mounted in the same enclosure.

Question: *Can you add three I/O modules and two CLIP Modules remotely mounted 600 feet away?*

Answer: There are four I/O modules in the same enclosure as the Power Supply, and a total of four modules remotely mounted. (Remember when calculating the number of modules, the CLIP counts for 1/2 module.) This makes for a total of eight modules. Thus, this configuration is within the limitations of Rule #2 (One power supply will support up to 8 modules.).

But, as is stated in Rule #1, the sum of the distances of power wire from the Power Supply to each remote module must be less than 2250 feet. In this case, the total distance to the remote modules is 2400 feet (3 * 600 = 1800, 1* 600 = 600). Thus, Rule #1 makes the answer to this example *NO.*

Solution: These I/O modules and CLIPs should be powered locally, either with individual power supplies or with a UT203 FID Power Supply.

Power Wiring - Using the UT203 FID's Power Supply

1. Using Contractor-provided 16 gauge, 2 conductor shielded cable, connect power from the last module in the enclosure to the remote module(s).

   Wire from the connector labelled *Power* on the last I/O or CLIP Module in the enclosure to the connector labelled *Power* on the first remote module.

note

Connect wires in order from Pin 1 of the first connector to Pin 1 of the next connector, and Pin 2 to Pin 2. Pin 3 is not used.

Terminate the shield on the cable to the mounting screw of the last module in the enclosure. Refer to Figure 14 on the next page.

If daisy chaining remote modules together, tie the shield on the far end of the cable to the beginning of the shield on the cable going to the next module. Refer to Figure 14.

If this is the only remote module or the last remote module in a daisy chain, cut the shield on the far end of the cable back so as not to cause shorts. Do not ground this end of the shield. Refer to Figure 14.

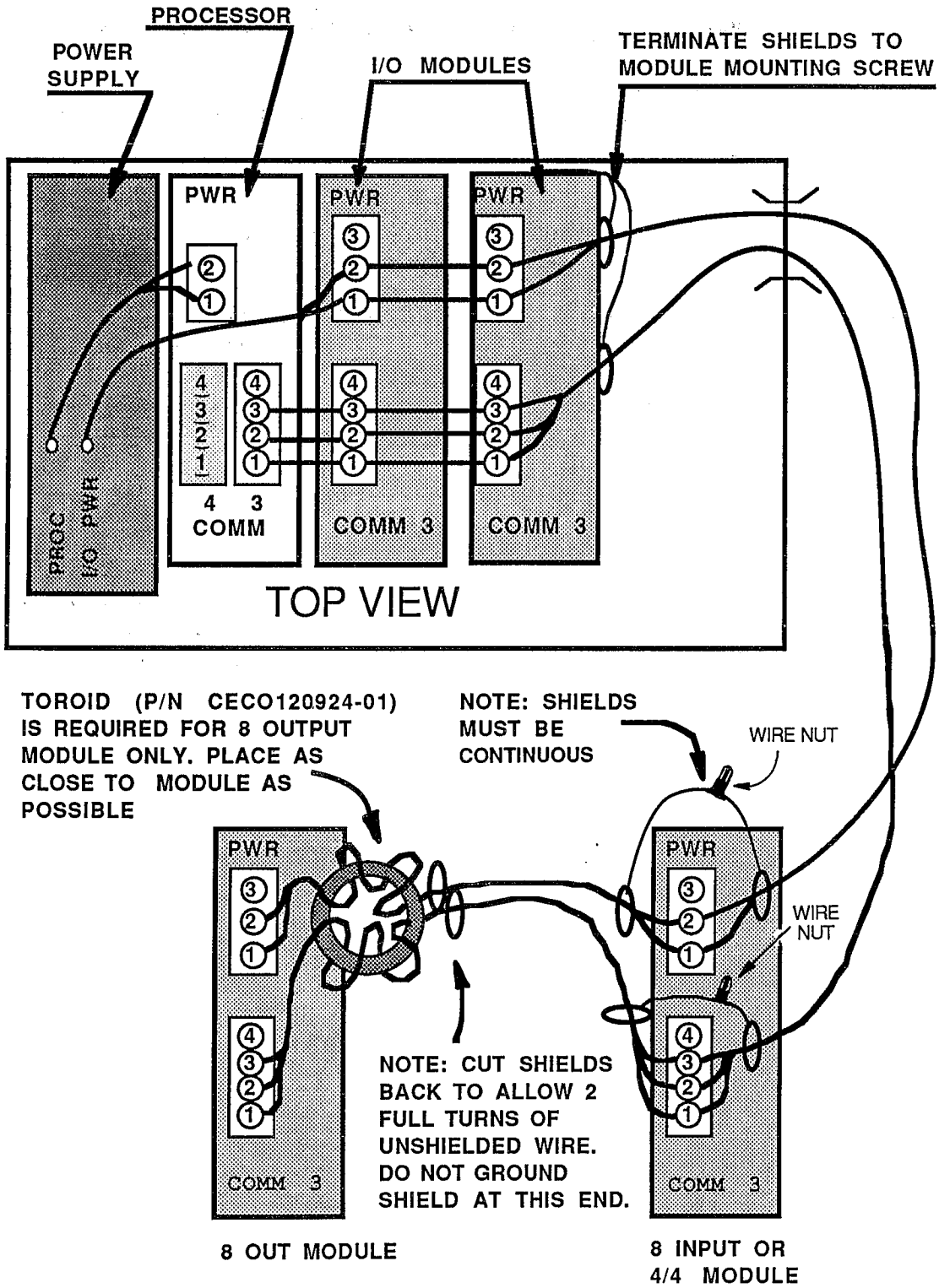


Figure 14 - Remote Module Power & Communication Wiring (Using the UT203 FID'sPower Supply)

Special Instructions for 8 Output Module

If the 8 Output Module is being remotely mounted, additional filtering shielding is required. A ferrite toroid (available from Carrier, P/N CECO120924-01) must be used for each remotely mounted 8 Output Module.

Place the toroid as close as possible to the module's communication and power connectors.

Loop the power supply and communication cables through the center of the toroid at least three times (i.e. 2 full turns) before connecting them to the COMM3 and Power connectors. Refer to Figure 15 below.

Be sure all device and sensor cables run aproximately 10 to 12 inches away from the module before joining with the power supply and communication cables.

If the 8 Output Module is mounted inside an enclosure and the interconnecting power cables are run inside conduit, then the toroid is not required.

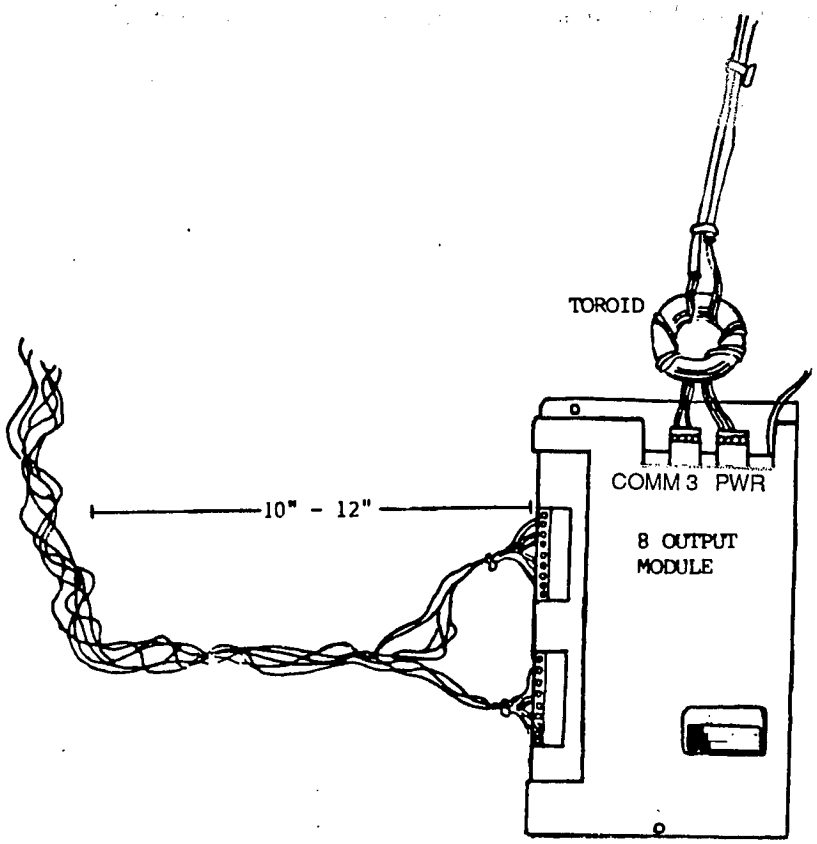


Figure 15 - Remote 8 Output Module Power and Communication Wiring

Remote Modules - Powered by Local Power Supply

Remote modules may be powered by a separate power transformer mounted with the module.

The power transformer required is Carrier P/N CEAS221045-01. It requires 120 Vac in and produces 20 Vac @ 0.5 Amps, which is enough to power one I/O module or two CLIP Modules.

Wire according to the following instructions:

1. Supply 120 Vac to a receptacle within 5 feet of the module power connector.

2. Remove the 3 pin female connector from the module power connector labelled *PWR*.

3. Plug the 3 pin female connector from the power transformer into the connector labelled *PWR* on the module. Refer to Figure 16 on the next page.

4. Plug the power transformer into the 120 Vac receptacle.

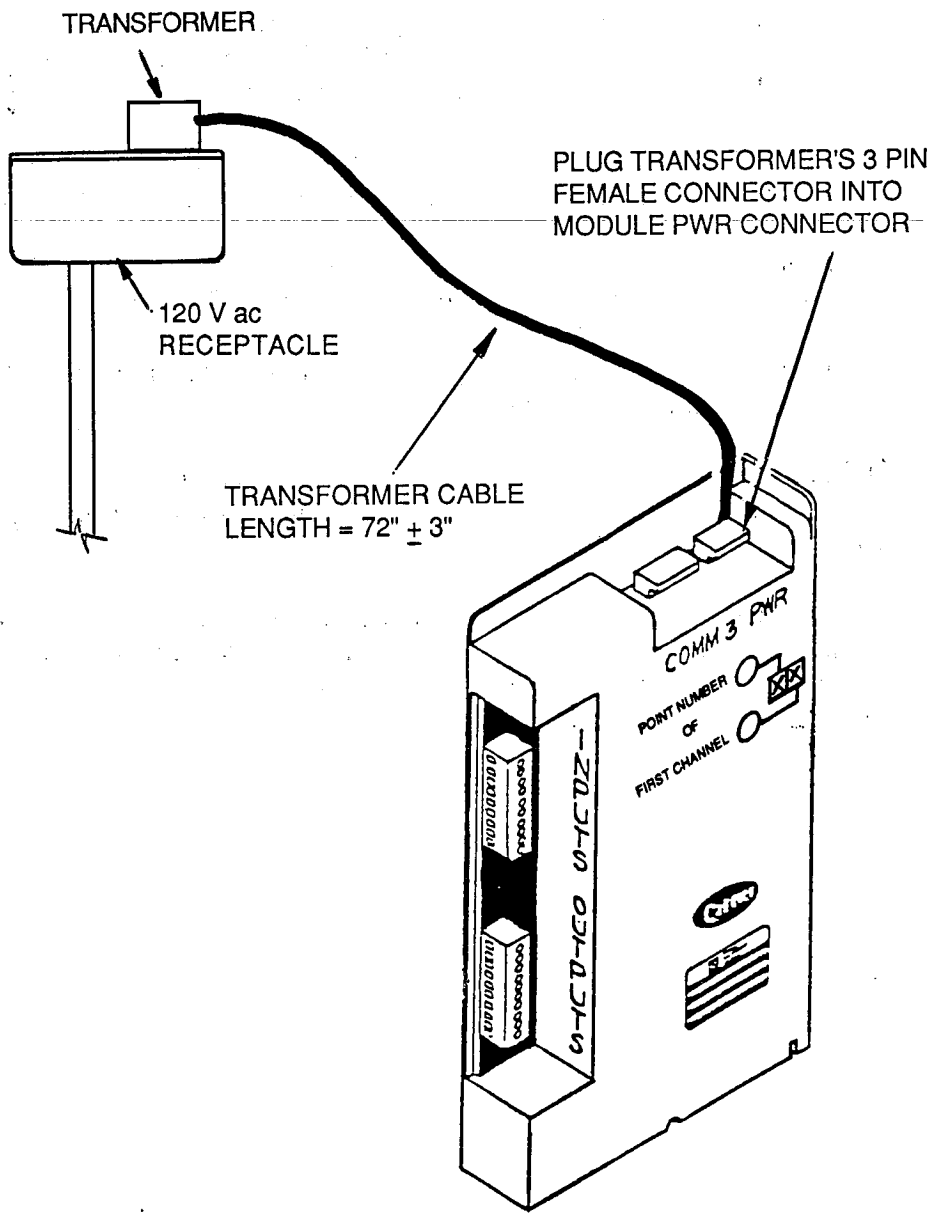


Figure 16 - Remote Module - Powered by a Local Power Supply

Remote Module Communication Wiring

Remote module communication wiring can only be completed after the Processor Module, the I/O modules, and CLIP Modules have been installed in the primary UT203 FID enclosure. Installation of the modules is typically done by a Carrier representative and the wiring is done by the Contractor.

1. Using Contractor-provided #20 gauge, 3 conductor shielded cable (refer to Appendix A on page 59 for approved cable), connect communications from the last module in the enclosure to the remote module(s).

   Wire from the connector labelled *COMM3* on the last I/O module in the enclosure to the connector labelled *COMM3* on the first remote module.

note

   Connect wires in order from Pin 1 of the first connector to Pin 1 of the next connector, Pin 2 to Pin 2 and Pin 3 to Pin 3. Refer to Figure 17.

   Terminate the shield on the source of the cable to the mounting screw of the last module in the enclosure.

   If daisy chaining remote modules together, tie the shield on the far end of the cable to the beginning of the shield on the cable going to the next module.

   If this is the only remote module or the last remote module in a daisy chain, cut the shield on the far end of the wire back so as not to cause shorts. Do not ground this end of the shield.

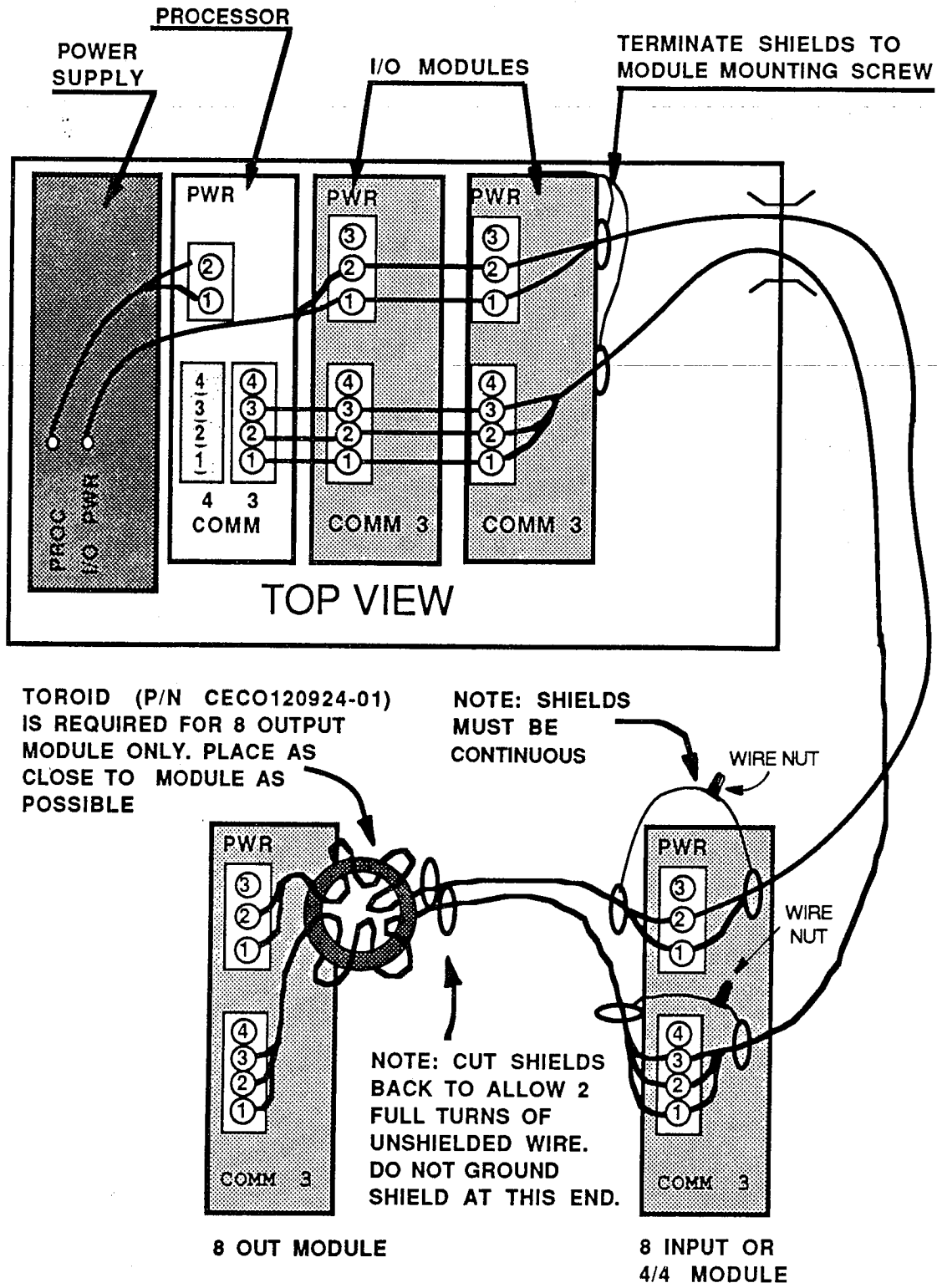


Figure 17 - Remote Module Communication & Power Wiring

Special Instructions for 8 Output Module

If the 8 Output Module is being remotely mounted, additional filtering and shielding is required. A ferrite toroid (available from Carrier P/N CEC0120924-01) must be used for each remote mounted 8 Output Module.

Place the toroid as close as possible to the module's power and communication connectors.

Loop the communication and power supply cables through the center of the toroid at least three times (i.e. 2 full turns) before connecting them to the COMM3 and Power connectors.

Be sure that all device and sensor cables run 10 to 12 inches away from the module before joining with the power supply and communication cables. Refer to Figure 18.

If the 8 Output Module is mounted inside an enclosure and the interconnecting power cables are run inside conduit, then the toroid is not required.

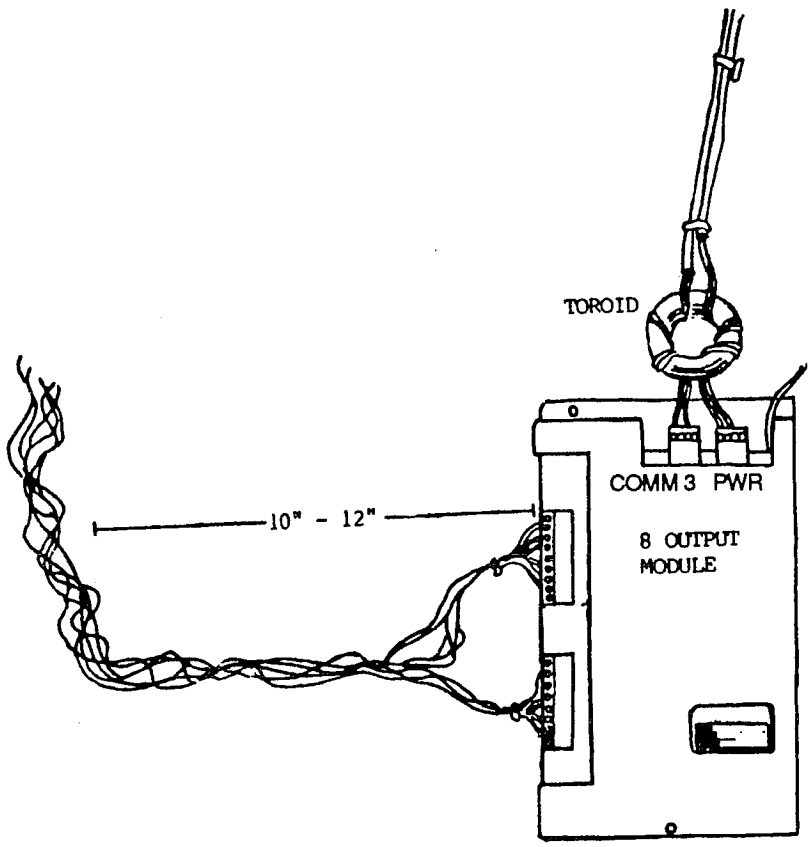


Figure 18 - Remote 8 Output Module Power & Communication Wiring

Appendixes

Appendix A - UT203 FID Wire Specifications

APPLICATION			WIRE TYPE - CROSS REFERENCE TABLE B										
			A	B	C	D	E	F	G	H	I	J	K
CCN COMM BUS	WITHIN BLDG	REGULAR	◉	●	●	●							
		HIGH TEMP			◉	●							
		PLENUM				◉							
	BETWEEN BLDGS			◉									
POWER	WITHIN AN ENCLOSURE		●	●	●	●	◉	●	●	●	●	●	●
	REMOTE WITHIN BLDG	REGULAR								◉	●		
		HIGH TEMP									◉		
		PLENUM									◉		
	REMOTE BETWEEN BLDGS		POWER LOCALLY										
FID MODULE COMM	WITHIN AN ENCLOSURE		◉	●	●	●							
	REMOTE WITHIN BLDG	REGULAR	◉	●	●	●							
		HIGH TEMP			◉	●							
		PLENUM				◉							
	REMOTE BETWEEN BLDGS			◉									
FID INPUT OUTPUT	WITHIN BLDG	REGULAR	●	●	●	●	◉	●	●	●	●	●	●
		HIGH TEMP			●	●			●		●	◉	
		PLENUM				●			◉		●		
	BETWEEN BLDGS			●									◉
PULSED DISCRETE INPUT	WITHIN BLDG	REGULAR	●	●	●	●		◉	●	●	●		●
		HIGH TEMP			◉	●			●		●		
		PLENUM				●			◉		●		
	BETWEEN BLDGS			●									◉

◉ - RECOMMENDED ● - ALTERNATE

Appendix A - (Continued)

WIRE TYPE	MANUFACTURER	CABLE NUMBER(S)	
A	ALPHA	2413	5463
	AMERICAN	A22503	
	BELDEN	8772	
	COLUMBIA	02525	
B	ALPHA	1742	
	COLUMBIA	01643	01332
	MANHATTAN	M1123	
C	ALPHA	45463	
D	ALPHA	55463	
	BELDEN		
E	ALPHA	1895	5052
	AMERICAN	A20202	A21501
	BELDEN	8205	
	COLUMBIA	06351	
F	ALPHA	2412	
	BELDEN	9154	
	COLUMBIA	02540	
G	ALPHA	58421	
	BELDEN	83602	
H	ALPHA	2432	5362
	AMERICAN	A22702	
	BELDEN	9342	
I	ALPHA	55362	
J	ALPHA	6642	
K	ALPHA	1712	1741
	AMERICAN	A33902	
	COLUMBIA	01642	
	MANHATTAN	M3206	

Appendix B - Error Messages

During normal operation, the following error messages may appear on the two LEDs labelled *Decision Number* on the OM display:

Message	Meaning/Action
E0	OM communication with the UT203 FID is not established. Repeat the sign on procedure.
E2	The command does not apply to the selected channel.
E3	Point does not exist.
E4	Point is not configured.
E5	Limit exceeded on analog force.
E6	Decision number does not exist.
E7	OM communication has failed with the UT203 FID; unplug the OM and carefully plug it back in.
E8	OM communication has failed; press CANCEL and try again.
E9	OM communication has timed out; press CANCEL and try again.

Reader's Comments

Your comments regarding this manual will help us improve future editions. Please comment on the usefulness and readability of this manual, suggest additions and deletions, and list specific errors and omissions.

_____

(Enter Document Name)

Usefulness and Readability:

_____

_____

_____

Suggested Additions and Deletions:

_____

_____

_____

Errors and Omissions (Please give page numbers):

_____

_____

_____

Name: _____

Title or Position: _____

Organization: _____

Address: _____

_____

Carrier Corporation
4 Farm Springs Rd.
Farmington, CT 06032

Attn: CCN Documentation

UNITED TECHNOLOGIES CARRIER

Printed in U.S.A. 808 - 532 Revised 1/89