



ACCURATE ELECTRONICS INC

PO BOX 1654 97075-1654 8687 SW HALL BLVD 97008 BEAVERTON OR USA 503.641.0118 FAX 503.646.3903

WWW.ACCURATE.ORG

Practice Section 101012xx Rev A

TYPE-10 UNIVERSAL MOUNTING SHELF

MODEL 101012xx



1. GENERAL

1.01 This practice provides application, specification, circuit and mechanical description, maintenance, installation, and warranty information relating to Accurate Electronics' Type-10 Universal Mounting Shelf, Model 101012xx.

1.02 The Type-10 Mounting Shelf provides relay-rack mounting for Accurate Electronics' Type-10 printed circuit modules. These modules plug into 56-pin edge connectors at the rear of the shelf. Gold-plated, bifurcated contacts in these edge connectors ensure positive contact with each module. Connections between modules and to equipment external to the shelf are made via wire-wrapping pins on the back of the edge connectors or 25-pair RJ-21 connectors available in various configurations.

1.03 Customer tailored versions are given their own model numbers. A new model-specific practice will layout the details. Please inquire for customer shelf configurations.

1.04 Relay-rack configured Type-10 Shelves are also available in universally wired versions and in connectorized universally wired versions. The Type-10 Universal Shelf and Connectorized Universal Shelf each have a rear-mounted hinged back plate at which main-frame tie cables are terminated. The Universal Shelf terminated these tie cables via wire-wrapping, while the Connectorized Universal Shelf is equipped with three 25-pair female cable connectors for tie-cable termination. The Connectorized Universal Shelf also has four 12-pin wire-wrapping connectors on the back plate for battery (BATT), ground (GND), and ring generator (RING GEN) connections.

1.05 On both Universal and Connectorized Universal Shelves, jumpers are distributed from the wire-wrapping pin field on the underside of the back plate (the side facing the rear of the shelf) to wire-wrapping pins at the back of the individual module mounting positions. The back plate and its connector and pins function much like an intermediate distributing frame, allowing the CO installer to terminate all main-frame tie cables (via either wire-wrapping or 25-pair connector) when the shelf is installed. Then, as requirements arise, appropriate jumpers can be run from the underside of the back plate to the wire-wrapping pins at the back of the appropriate module positions. When a disconnect (removal) or change order is received, only the jumpers, and not the tie cable, need be cut and removed or changed.

1.06 Four versions of the basic (non-universal) Type-10 Shelf are available, and are designed specifically for relay-rack mounting. Some Type-10 Shelves will accept slightly wider Wescom/Charles Ind.Type-400 modules as well as Accurate Electronics' modules. Those shelves designed to house only Accurate Electronics' Type-10 modules permit a slightly greater mounting density (see Table 1).

1.07 The capacities, applications and the modules that the Type-10, Type-10 Universal and Type-10 Connectorized Universal Mounting Shelves can accommodate are listed in Table 1.

Contents

Section 1. General	1
Section 2. Specification	2
Section 3. Circuit Description	2
Section 4. Mechanical Outline	2
Section 5. Installation	2
Section 6. Testing and Troubleshooting	3
Section 7. Maintenance	3
Section 8. Warranty	3
Figure 2. Mechanical Outline	5
Figure 3. Relay Rack Shelf Mounting	4
Table 1. Type-10 Shelf Versions	3
Table 2. Shelf Capacity, 1 ¾ MTG Relay Racks	3
Table 3. Shelf Capacity, 2 IN MTG Relay Racks	3



1.08 The Type-10 Shelf is approximately 6 inches high and protrudes approximately 4 3/4 inches in front of and 0 inches behind the upright frame channel of a standard relay-rack. The Type-10 Universal and Connectorized Universal Shelves are approximately 6 inches high and protrude approximately 4 3/4 inches in front of and 1 1/2 inches behind the upright frame channel of a standard relay-rack. Four each of mounting screws, washers and nuts are provided with each shelf for securing the shelf to the relay-rack.

1.09 Type-10, Type-10 Universal, and Type-10 Connectorized Universal Shelves are constructed of lightweight brushed aluminum. Large ventilation openings in the top and bottom of each shelf provide a vertical chimney for the escape of heat generated by the electronic equipment mounted therein. When a number of shelves are stacked in a relay-rack, convection currents drawn through the chimney aid in keeping the equipment cool. An integral brace plate between module positions at the center of relay-rack versions of the shelf ensures rigidity and prevents warpage. Plastic card guides in the interior of the shelf allow modules to be easily inserted into their correct plug-in connectors.

2. SPECIFICATIONS

Type-10 Connectorized Shelves

These Shelves are not compatible with Wescom/Charles Ind. Type-400 modules and others of like dimensions.

2.01 Electrical

See FIGURE 1.

2.02 Environmental

Operating Temperature: 55 to +100° C
 Humidity: up to 95% R.H. / No condensation

2.03 Physical

Capacity Mounting: 12 modules, 19-inch relay-rack
 Finish: clear aluminum, no markings
 Connectors: 56-pin, with bifurcated, gold-plated contacts
 black, no markings
 Weight: 6.0 lbs. 1 oz. / 2.75 kg.
 Dimensions: 5.92”H x 9.90”D x 17.50”W
 15.04cmH x 25.15cm D x 44.45cmW
 (excluding mounting ears)
 Mounting Hole Configuration: 18.310”W x 1.750”H
 46.507 cm W x 4.445 cm H
 (1.25” EIA spacing)
 Ship-with-kit: (4) 12/24 x 3/4 phillis screws,
 (4) #12 hex nuts, (4) #12 flat washers

3. CIRCUIT DESCRIPTION

3.01 See FIGURE 1.

4. MECHANICAL OUTLINE

4.01 See FIGURE 2.

5. INSTALLATION

5.01 The Type-10 Universal, or Type-10 Connectorized Universal Mounting Shelf should be visually inspected upon arrival to find possible damage incurred during shipment. If damage is noted, a claim should immediately be filed with the carrier. If stored, the shelf should be visually inspected again prior to installation.

Mounting

5.02 Relay-rack-configured Type-10 Shelves (the 101012xx, as well as their Universal and Connectorized Universal counterparts) require an average of 3.5 mounting spaces (6 1/8 inches) per shelf in racks with 1 3/4-inch mounting

spaces and 3.0 mounting spaces (6.0 inches) per shelf in relay-racks with 2-inch mounting spaces. The maximum numbers of shelves that can be mounted in relay-racks of various heights are listed in TABLES 2 and 3.

5.03 Relay-rack-configured Type-10 Shelves can be mounted in any desired arrangement in 19 or 23-inch relay-racks with 1 3/4 inch mounting spaces (i.e., drilled on 1 3/4 inch centers). In the most efficient arrangement, shelves 1 and 2 together occupy exactly seven mounting spaces. This leaves complete mounting spaces immediately above and below shelves 1 and 2 for mounting additional equipment (such as a jackfield, fuse panel, or, as shown, another shelf. See FIGURE 3). This arrangement is the most efficient because it minimizes the occurrence of unusable partial mounting spaces.

NOTE: When mounting Type-10 Shelves, be certain that the screw holes in the shelf mounting ears and those in the relay-rack are lined up exactly and that screws (two per mounting ear) are inserted exactly. Note that a 1/4 inch (0.250) gap will occur between shelves 1 and 2; this gap will also occur between shelves 3 and 4, 5 and 6, etc. No gap will exist between shelves 2 and 3, 4 and 5, etc. If shelf 1 is mounted properly, the others will automatically fall into the correct pattern. See FIGURE 3.

5.04 When relay-rack configured Type-10 Shelves are mounted on 23-inch racks with 2-inch mounting spaces (i.e., drilled on 2-inch centers), each shelf occupies 3.0 mounting spaces, and there are no gaps between shelves. For maximum density, install the first shelf as close to the top of the rack as alignment of the mounting holes allows.

Tie Cable Installation

5.05 Accurate Electronics recommends the use of three tie cables from the main frame to the Universal and Connectorized Universal Shelves. The use of separate transmit, receive, and signaling / 2wire cables minimizes crosstalk and separates high and low transmissions levels. On Universal Shelves, tie cables are terminated to appropriate wire-wrapping pins on the rear of the back plate. On Connectorized Universal Shelves, tie cables are terminated at connectors J1 through J3. Two rows of 12-pin wire-wrapping terminals, BATT and GND, are used for battery and ground connections, respectively. Two rows of 12-pin wire-wrapping terminals labeled RING GEN are used for ringing generator connections.

Universal Shelves

5.06 Tie cables from the main frame are routed to the Universal Shelf from the left side (looking at the shelf from the rear). As the cable approaches the shelf, two tie mounts are provided to stabilize and properly route the cable. At this point, the tie cable is routed downward into a service loop that allows the hinged back plate to swing open freely. The loop must be full but should not extend below the bottom of the shelf, as it could then interfere with the shelf immediately below. After the service loop, the cable is routed upward and across the top of the back plate to two tie mounts for stability at this end of the loop. Individual leads are then routed downward across the bottom of the back plate and fanned up to the appropriate wire-wrapping pins. Tie mounts are provided across the bottom of the back plate to dress groups of leads. Tie cables to the Type-10 Universal Shelf must be routed as described above to prevent undue bending, fatigue, and resultant physical failure of the cable as the back plate is moved from the open position to the closed position.

Connectorized Universal Shelves

5.07 Connectorized tie cables from the main frame are routed to the Connectorized Universal Shelf from the left side (looking at the shelf from the rear). As the cable approaches the shelf, two tie mounts are provided to stabilize and properly route the cable. At this point, the cable is routed downward into a service loop, in essentially the same manner as for the Universal Shelf. Again, the loop must be full but should not extend below the bottom of the shelf. After the service loop, the cable is routed directly to one of the 25-pair cable connectors. The back plate of the Type-10 Connectorized Universal Shelf has a reversible connector hold-down bracket for use with both low-profile and high-profile cable connector hoods. This bracket is secured via two screws to standoff posts on the rear of the back plate and must be removed to install the 25-pair cables. After the tie cables are installed, replace the bracket. Tie cables to the Type-10 Connectorized



WWW.ACCURATE.ORG PO BOX 1654 97075-1654 8687 SW HALL BLVD 97008 BEAVERTON OR USA 503.641.0118 FAX 503.646.3903

Universal Shelf must be routed as described above. Non-connectorized tie cables from the main frame (battery, ground, or ring generator connections) are routed to the Connectorized Universal Shelf as described in Paragraph 5.06.

Jumper Installation

5.08 Jumper leads from the back plate to various module positions may be installed as required. Leads from the various module positions are routed up and through wire guides at the top of the shelf, then to the left rear side of the shelf, where a service loop must be constructed to provide freedom of movement for the hinged back plate and to position the leads to prevent fatigue and subsequent failure as the back plate is opened and closed. One wire saddle is provided near the bottom of the service loop to maintain the loop's position. The loop extends to the bottom of the shelf (excluding mounting ears) from the top of the back plate down to appropriate pins. Saddles are provided across the top of the back plate to dress the cable.

5.09 After all wiring is completed, return the hinged back plate to the closed position. To secure the back plate, a spring-loaded fastener at the lower right-hand corner of the back plate is screwed into a receptacle on the main body of the shelf.

6. TESTING AND TROUBLESHOOTING

6.01 A predetermined procedure to test the wiring in an installed Type-10, Type-10 Universal, or Type-10 Connectorized Universal Shelf is impossible because of variance in wiring schemes. The shelf should be thoroughly physically inspected before mounting, however, to ensure that there are no bent or broken connector pins or other visible defects. If trouble is encountered in an operational shelf, ensure that all modules are seated properly and operating correctly and that all wiring is correct. If a shelf is suspected of being defective, a new one should be substituted and the tested

conducted again. If the substitute operates correctly, the original should be considered defective and returned to Accurate Electronics for repair or replacement as directed below. We strongly recommend that no internal (component-level) testing or repairs be attempted on Accurate Electronics' equipment. Unauthorized testing or repairs may void its warranty. Note: If equipment must be marked defective or bad, we recommend that it be done on a piece of tape or on a removable stick-on label.

Technical Assistance

6.02 Contact Accurate Electronics, Inc. 503.641.0118, FAX: 503.646.3903; Mail: PO Box 1654, Beaverton OR 97075-1654.

**TYPE-10 UNIVERSAL MOUNTING SHELF
RETURN PROCEDURE (FOR REPAIR)**

6.03 To return equipment for repair, first contact Accurate Electronics, Inc. Enclose an explanation of the malfunction, your company's name and address, the name of a person to contact for further information, and the purchase order number for the transaction. Accurate Electronics will inspect, repair, and retest the equipment so that it meets its original performance specifications and then ship the equipment back to you. If the equipment is in warranty, no invoice will be issued.

7. MAINTENANCE

7.01 No preventive maintenance is required. General care is recommended.

8. WARRANTY

8.01 All Accurate Electronics Inc. products carry a full FIVE (5) YEAR warranty on materials and workmanship. See WARRANTY in front of catalog.

Table 1. Type-10 Shelf Versions

Model	# of Modules	Relay Rack size	Module Manufacturer Accepted
101012, 101012U, 101012UC	12 modules	19"	Accurate Type-10, Tellabs, and Wescom/Charles Ind (Type 400)
		23"	Accurate Type-10
101012Wxx	12 modules	19"	Accurate Type-10

Table 2. Shelf Capacity, 1 3/4 MTG Relay Rack

Type of Rack Support	Overall Height	# of Mounting Spaces	Maximum # of Type-10 Shelves
floor	5 ft. 2 1/8 in.	31	8
floor	7 ft 0 in.	43	12
floor	9 ft 0 in.	56	16
overhead	8 ft 8 in.	48	13
overhead	11 ft 6 in.	68	19

Table 3. Shelf Capacity, 2" MTG Relay Rack.

Type of Rack Support	Overall Height	# of Mounting Spaces	Maximum # of Type-10 Shelves
floor	7 ft 0 in.	37	12
overhead	8 ft 8in.	42	16
overhead	11 ft 6 in.	62	20



Note: Warranty service does not include removal of permanent customer markings on the front panels of Accurate Electronics' modules, although an attempt will be made to do so. If a product must be marked defective, we recommend that it be done on a piece of tape or on a removable stick-on label.

8.02 If a situation arises that is not covered in the checklist, contact Accurate Customer Service as follows (telephone number are given below):

Contact Accurate Electronic Customer Service

8.03 If a product is diagnosed a defective, follow the replacement procedure in paragraph 9.04 when a critical service outage exists (e.g., when a system of a critical circuit is down and no spares are available). If the situation is not critical, follow the repair and return procedure in paragraph 9.05.

Replacement

8.04 To obtain a replacement product, notify Accurate Electronics. Be sure to provide all relevant information, including the part number that indicates the issue of the product in question. Upon notification, we shall ship a replacement product to you. If the product in question is in warranty, the replacement will be shipped at no charge. Pack the defective product in the replacement product's carton, sign the packing slip included with the replacement, and enclose it with the defective product (this is your return authorization). Affix the preaddressed label provided with the replacement product to the carton being returned, and ship the product prepaid to Accurate Electronics.

Repair and Return

8.05 Return the defective module, shipment prepaid, to Accurate Electronics Inc.:

ACCURATE ELECTRONICS INC.
ATTN: REPAIR AND RETURN
8687 SW HALL BLVD. #100
BEAVERTON, OREGON 97008 USA

FIGURE 3. Relay Rack Shelf Mounting.

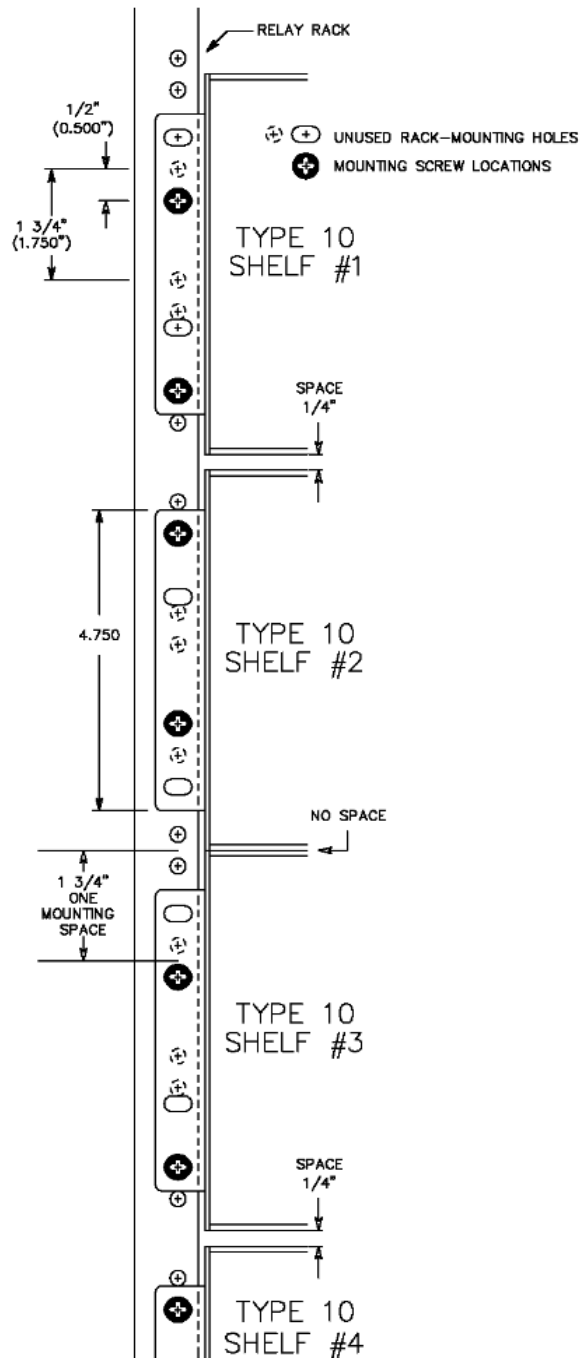
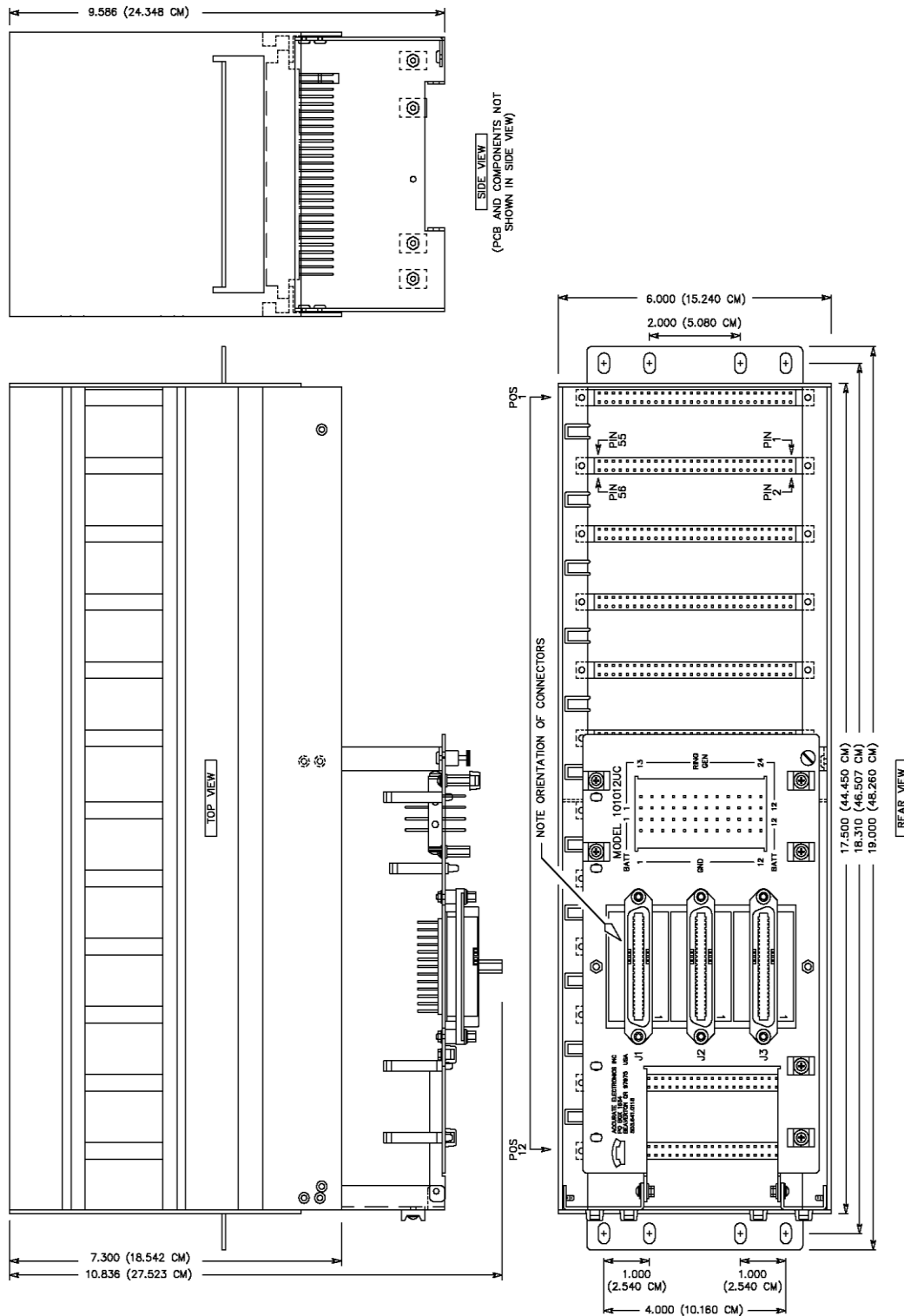




FIGURE 2. MECHANICAL OUTLINE. (MODEL 101012UC SHOWN)





This page intentionally left blank.