ATS Annunciator - MODBUS

ATS Annunciator monitors and controls up to 8 Automatic Transfer Switches equipped with the MX150/250 Controller.

Before getting started, have the following tools and information available:
- PC or Laptop with USB
- USB to RS-485 adapter - FTDI Chip USB-RS485-WE-1800-BT or similar.
- ATS Annunciator Tool - PC graphic user interface for ATS Annunciator configuration
- Screw Driver - Phillips #2
Review Information sections before beginning installation. Information sections follow installation steps

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**Step 1 - Mount Annunciator**
1. Attach both mounting brackets to unit - 2 screws each bracket  
   Brackets may be attached to top and bottom or left and right sides.  
   Orient brackets for wall or flush mount.
2. Mount unit to desired NEMA-1 location.

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**Step 2 - Run Conduits**
Run conduits  
   Between the Annunciator and all ATSs.  
   Between the Annunciator and the power source.

Knockouts are located on all 4 sides of the Annunciator.

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**Step 3 - Ground Annunciator**
Ground to 6-32 stud inside box.
Step 4 - Connect MODBUS Networks

MODBUS networks - See Information: MODBUS Networks

• Networks may be either Singly Terminated or Doubly Terminated.
• The Annunciator has two separate MODBUSs.
  ATS MODBUS connects to ATSs - 8 max.
  PC MODBUS connects a PC to Annunciators - max 32.
MODBUS connections are to a detachable terminal block.

1. Open Annunciator - remove front cover screws.
2. Connect MODBUS cables:
   a. ATS MODBUS to ATSs
   b. PC MODBUS to PC and additional Annunciators, if present.
3. Terminate ATS MODBUS - typically in the ATS at one or both ends of the bus.
4. Terminate the PC MODBUS at its non-PC end (typical):
   a. The Annunciator at the non-PC end of the bus: Place jumper across HDR5 positions 2&3.
   b. All other Annunciators: Place jumper across HDR5 positions 1&2.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>ATS MODBUS A</td>
</tr>
<tr>
<td>2</td>
<td>ATS MODBUS B</td>
</tr>
<tr>
<td>3</td>
<td>MODBUS RETURN</td>
</tr>
<tr>
<td>4</td>
<td>PC MODBUS A</td>
</tr>
<tr>
<td>5</td>
<td>PC MODBUS B</td>
</tr>
</tbody>
</table>

MODBUS Detachable Terminal Block (HDR4)

HDR5
PC MODBUS Termination
Jumper 2&3: terminated
Jumper 1&2: Not terminated (shown)

Annunciator Card - on inside of front cover

Power Detachable Terminal Block (provided attached to HDR3) (Step 5)
MODBUS Detachable Terminal Block (provided attached to HDR4)
Status LED
Factory Reset and Firmware Update switch
**Step 5 - Connect Power**

Power connections are to a detachable terminal block (provided attached to HDR3, see Step 4 figure).

Input voltage range: 16 - 30VAC or VDC

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**Step 6 - Configure Annunciator - ATS Annunciator Tool**

The ATS Annunciator Tool is a graphic user interface that runs on a PC and communicates with the Annunciator via the PC MODBUS connection through an external USB to RS-485 adapter (not furnished).
1. **PC Serial Port Settings > Serial Port** - set per the USB to RS-485 adapter instructions; **Connect**.

2. **Annunciator Information > Annunciator ID** - Select Annunciator to communicate with from list of connected IDs.

3. **From PC (Host) MODBUS Port Settings > Annunciator ID** - Configure as specified in site installation instructions, if provided.
   - Set/change Annunciator ID from list IDs (1 -32); **SUBMIT**.
   - Each Annunciator on the network must have a unique ID. Factory default ID is 1.

   **Procedure for setting IDs for multiple Annunciators**
   - Verify no connected Annunciator has ID = 1 - View list of connected IDs above.
   - Connect a factory fresh Annunciator (ID=1).
   - Select Annunciator ID 1 per step 2 above.
   - Change Annunciator ID to a unique number other than 1 per step 3 above.
   - Repeat from step a for additional Annunciators.

   Remove Annunciators from the PC MODBUS network by removing their power connector or the PC MODBUS detachable block from their circuit card (see Step 4). Then **Disconnect** and **Connect** the Annunciator Tool to re-scan the PC MODBUS.

4. **To ATS MODBUS Port Settings**; click **SUBMIT**.
   - ATS-1: through ATS-8: -
   - For each desired Annunciator ATS position select the desired ATS ID from list IDs (1 -247) or “None” as specified in the site installation instructions.
   - “None” must be selected for each Annunciator ATS position not connected to an ATS.
   - Click **SUBMIT**.

   Multiple ATs with the same ID will be indicated by continuously increasing error count. See Troubleshooting (page 9).

5. **Other Settings and Controls** - as specified in site installation instructions.

6. **Repeat from step 2** for additional Annunciators.

**Note:** Re-scan may be necessary to discover newly connected or disconnected Annunciators. Disconnect and Connect the Annunciator Tool to re-scan the PC MODBUS.
**LEDs and Operation**

KEY SWITCH
The MONITOR position allows operation of LEDs only.
The CONTROL position allows operation of LEDs and the pushbuttons.

Power LED
Indicates Annunciator is powered.

SOURCE — S1 (Normal) LED (Green)
Indicates that the corresponding Transfer Switch has an acceptable Normal source.

SOURCE — S2 (Emergency) LED (Red)
Indicates that the corresponding Transfer Switch has an acceptable Emergency source.

POSITION — S1 (Normal) LED (Green)
Indicates that the corresponding Transfer Switch load is connected to the Normal source.

POSITION — S2 (Emergency) LED (Red)
Indicates that the corresponding Transfer Switch load is connected to the Emergency source.

TIME DELAY — ACTIVE LED (Yellow)
Indicates that the corresponding Transfer Switch has a timer functioning. Timers monitored include all timers associated with delaying transfer in either direction.

TIME DELAY — SKIP Push Button
Immediately skip (lapse / terminate) T or W timer whichever is timing concurrent with pushbutton activation.
ATS timers will be bypassed during a test sequence if pressed before the TEST — Initiate Push Button

TEST — IN PROGRESS LED (Yellow)
Indicates the corresponding Transfer Switch is in a test mode. Indication will occur whether the test is initiated at the annunciator or locally at the ATS.

TEST — INITIATE/CANCEL Push Button
Begins/Cancels a load transfer test sequence (power loss simulation). Press and release to Begin/Cancel Test.
Transfer is complete when both S2 Position and Source LEDs illuminate.
Transfer is complete when both S1 Position and Source LEDs illuminate.
CANCEL ends the test and transfers back to the normal source.
(Key Switch must be in the Control position)

LAMP TEST — Initiate Push Button
Turns all LEDs on for approximately 10 seconds.
Information
MODBUS Networks

Networks may be either Singly Terminated or Doubly Terminated. The Annunciator has two separate MODBUSs.
• ATS MODBUS connects to ATSSs. - 8 max.
• PC MODBUS connects a PC to Annunciators - max 32.

Network Termination
Cables:
• 300V rated insulation - Belden 9463
• 600V rated insulation - Belden 3072F
Resistors: 105Ω

Singly Terminated Network (Daisy Chain)
Maximum Total Network Cable Length: 500 M (1,640 ft)

Doubly Terminated Network (Daisy Chain)
Maximum Total Network Cable Length: 2,700 M (8,850 ft)
Information

MODBUS Device IDs
Each device on a MODBUS Network must have a unique ID.
Non-unique IDs cause communications conflicts and must be resolved. See Troubleshooting.

ATS IDs are set in the ATS MODBUS interface.
Annunciator IDs are set via the ATS Annunciator Tool (Step 6).

Factory reset
Factory default settings are Annunciator ID=1 (2 in Step 6) in and no configured ATS (4 in Step 6 all "None").
Press and hold Factory Reset and Firmware Update switch until the Status LED turns red (5 seconds) - 2 in figure in Step 4.
The Status LED will be green when Reset is complete.

Firmware Update
1. Download the Remote Upgrade Program to the PC - See Reference Documents.
2. Press and release Factory Reset and Firmware Update switch until the Status LED turns red (5 seconds) - 2 in figure in Step 4. The Status LED will blink red.
3. Run the Remote Upgrade Program on the PC.
   a. Establish communications with the Annunciator.
   b. Follow instructions as presented by the Remote Upgrade Program.
      The Status LED will be green when upgrade is complete.
      It may be necessary to press and release S2 to exit the programming mode.
Troubleshooting

MODBUS Device Address Conflict
Each MODBUS device must be configured with a unique address. Duplicate MODBUS IDs will cause indeterminate errors.
1. Check power supply for proper connection to annunciator unit. (Power LED inside unit will be ON if power supply is connected properly). See Step 5.

All LEDs Are OFF
1. Check power supply for proper connection to annunciator unit. (Power LED inside unit will be ON if power supply is connected properly). See Step 5.

LEDs for One or More ATSs Are All OFF
1. LEDs for ATS configured as “None” will all be OFF. See Configure Annunciator.
2. Are network terminations on ATS units connected?
3. Are all ATS units powered? Are all ATS units equipped with network interface cards?
4. Are all ATS units equipped with network interface cards?

Position and Source Availability LEDs Flash ON and OFF
This indicates that network connections are open between annunciator and corresponding ATS.
1. Is one of more ATS configured as present (not “None”), but not present on the network? See Configure Annunciator?
2. Are network terminations on remote ATS units connected?
3. Are all ATS units powered?
4. Are all ATS units equipped with optional MODBUS Interface Card (71R-2200 Modbus Card) and network cable connected?

Specifications and Application
• Specifications and ordering information are in the brochures listed in Reference Documents.
• Installation Environment - Install in Network Telecommunication Facilities, OSP, or where NEC applies.