Installation and Maintenance Manual

IM 1240-3

Group: Controls
Part Number: 910166126
Date: April 2018
Supercedes: IM 1219

Intelligent Equipment® for
Daikin Pathfinder® and Trailblazer® Air-cooled Chillers
Rebel® and Maverick® II Commercial Packaged Rooftops
RoofPak® Applied Packaged Rooftops and Outdoor Air
Handling Units

Models: AGZ-D, AGZ-E, AWS, AWV, DPS, MPS,
RAH, RDS, RDT, RPR and RPS
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Introduction

Revision History

<table>
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<tr>
<th>Literature Number</th>
<th>Release Date</th>
<th>Action</th>
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<tr>
<td>IM 1240-3</td>
<td>March 2018</td>
<td>Addition of Rooftop systems</td>
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<tr>
<td>IM 1240-2</td>
<td>November 2016</td>
<td>Addition of Pathfinder AWV chiller</td>
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<td>IM 1240-1</td>
<td>November 2015</td>
<td>Revised LAN configuration instructions</td>
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<td>IM 1240</td>
<td>May 2015</td>
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Reference Documents

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<tr>
<th>Number</th>
<th>Company</th>
<th>Title</th>
<th>Source</th>
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Limited Warranty

Consult your local Daikin Representative for warranty details. To find your local Daikin Representative, go to www.DaikinApplied.com.

General Information

This manual contains the information you need to install and configure the Intelligent Equipment solution on MicroTech® III Air-Cooled Chiller models: AGZ-D, AGZ-E, AWV, Packaged Rooftop models DPS and MPS (Maverick II), and Outdoor Air Handling Unit models: RPS, RPR, RDT, RFS, RDS and RAH..

For installation Technical Support, please contact the Daikin Applied Controls Support Group at (866) 462-7829.

Product Description

The Daikin Applied Intelligent Equipment® Software-as-a-Service (SaaS) solution provides facility and equipment management, monitoring, control, analysis, and decision-making via a secure, cloud-communicating machine-to-machine gateway that captures, analyzes and delivers building and equipment information, and third party content (i.e. - weather, utility, and CRM data), to a user device (smart phone, tablet, etc.) via wireless (cellular, Wi-Fi) or local area network (LAN) connection.

Intelligent Equipment provides real-time power monitoring of the site and individual equipment. The user can view unit statuses, modes, temperatures, pressures and setpoints, and make adjustments to modes, schedules and temperature setpoints. Messages and alarms can be viewed, acknowledged and cleared.

User accounts are role-based, and user interaction, including setpoint changes and clearing of alarms, is logged for later reporting. System updates can be delivered automatically from the cloud. Built-in trending tools provide easy access to unit performance history. The subscription-based SaaS is available with three interface options: Owner View, Technical View, and Owner/Technical View. Hardware components consist of: one Machine to Machine (M2M) Gateway, one Energy Management Module (EMM), two Antennas, and three Current Transformers (CT's).

Hazardous Information Messages

Recognize Safety Symbols, Words and Labels

The following symbols and labels are used throughout this manual to indicate immediate or potential hazards. It is the owner and installer’s responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of property damage and/or product damage, serious personal injury or death. Improper installation, operation and maintenance can void the warranty.

CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

DANGER

Dangers indicate a hazardous situation which will result in death or serious injury if not avoided. Electric shock hazard. Can cause personal injury or equipment damage. This equipment must be properly grounded. Connections and service to the MicroTech III Air-Cooled Chiller Packaged Rooftop, or Outdoor Air Handling Unit Controller, Machine-to-Machine Gateway and Energy Management Module must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

NOTICE

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense. Daikin disclaims any liability resulting from any interference or for the correction thereof.
Components

Machine-to-Machine (M2M) Gateway
The M2M Gateway is a factory tested and commissioned device, which analyzes and delivers data to the cloud via wireless (Wi-Fi, cellular) or local area network (LAN) connection. The M2M Gateway implements security, including data delivery via secure HTTPS using SSL, and whitelisting protection. In the case of a unit ordered with Intelligent Equipment, the M2M gateway will be factory-installed in the unit control panel. For installation in retrofit applications, see document section titled, Chiller Installation Instructions on page 7.

Antennas
Two Cellular/Wi-Fi antennas are provided with the Intelligent Equipment solution, and must be field-mounted, regardless of whether the Daikin Applied Intelligent Equipment solution was ordered factory-installed or for retrofit installation. In most cases, only one of the two antennas will be installed and connected to the M2M Gateway. The second antenna is used in situations where both cellular and Wi-Fi are used to deliver data to the cloud. Both antennas are shipped with a magnetic base, which is suitable for directly mounting to the unit control panel or case.

Energy Management Module (EMM)
The EMM is a factory tested and commissioned device, which monitors unit voltage, current, and power and transmits this data to the M2M Gateway for delivery to the cloud. In the case of a unit ordered with Intelligent Equipment, the EMM will be factory-installed in the unit control panel. For installation in retrofit applications, see document section titled, Installing Energy Management Module on page 9.

Current Transformers (CT’s)
Three Current Transformers (CT’s) are supplied with the Intelligent Equipment solution. At the time of order, the Maximum Current Ampacity (MCA) for the unit is specified, thereby driving selection of appropriately-sized CT’s (See Table 1 for CT sizing and specifications). In the case of a unit ordered with Intelligent Equipment, the CT’s will be factory-installed within the unit control panel. For installation of the CT’s in retrofit applications, see document section titled, Installing Spilt-Core CT’s on page 15.

Power Supply
A 24 VDC Power Supply is provided to power the M2M Gateway. In the case of a unit ordered with Intelligent Equipment, the power supply will be factory-installed in the unit control panel. For installation of the power supply in retrofit applications, see document section titled, Installing Power Supply on page 9.

Fuse Block
A Fuse Block is provided to provide over-current protection for the Energy Management Module (EMM). Replaceable 5Amp fuses are pre-installed in the Fuse Block. In the case of a unit ordered with Intelligent Equipment, the Fuse Block will be factory-installed in the unit control panel. For installation of the Fuse Block in retrofit applications, see document section titled, Installing Fuse Block on page 10.

USB-to-Ethernet Adapter
For installations where a Local Area Network (LAN) connection is to be used, a USB-to-Ethernet adapter is included in all shipments. The adapter is necessary because the M2M Gateway has a single Ethernet plug, which is connected to the MicroTech III controller, and, therefore, unavailable for connection to the LAN.

Table 1: CT Sizing and Specifications.

<table>
<thead>
<tr>
<th>Key Specifications</th>
<th>50A Model</th>
<th>100A Model</th>
<th>200A Model</th>
<th>600A Model</th>
<th>1000A Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window Size</td>
<td>0.4&quot; (10 mm)</td>
<td>1&quot; (25 mm)</td>
<td>1&quot; (25 mm)</td>
<td>1.25&quot; (31.8 mm)</td>
<td>2&quot; (50.8 mm)</td>
</tr>
<tr>
<td>Current Range</td>
<td>0.25 – 80A AC</td>
<td>1 - 200A AC</td>
<td>1 – 300A AC</td>
<td>12 – 780A AC</td>
<td>20 – 1300A AC</td>
</tr>
<tr>
<td>Output</td>
<td>333 mV at rated current</td>
<td>333 mV at rated current</td>
<td>333 mV at rated current</td>
<td>333 mV at rated current</td>
<td>333 mV at rated current</td>
</tr>
<tr>
<td>Ratio Error</td>
<td>&lt;0.5% from 0.25 – 80A AC (typical)</td>
<td>&lt;0.3% from 1 - 200A AC (typical)</td>
<td>&lt;1.0% from 1 – 300A AC (typical)</td>
<td>&lt;1% from 12 – 780A AC (typical)</td>
<td>&lt;1% from 20 – 1300A AC (typical)</td>
</tr>
<tr>
<td>Phase Error</td>
<td>&lt;1.5° from 1 – 80A AC</td>
<td>&lt;2° from 0.25 – 1A AC</td>
<td>&lt;0.5° from 1 - 200A AC</td>
<td>&lt;0.5° from 1 – 300A AC</td>
<td>&lt;2° from 12 – 780A AC</td>
</tr>
</tbody>
</table>

**CAUTION**
Extreme temperature hazard. Can cause damage to system components. The Intelligent Equipment hardware is designed to operate in ambient temperatures from -22 to 158 degrees F (-30 to 70 degrees C) and in relative humidity up to 90% (non-condensing).
Unpacking

Material shipped loose

Factory Installed IE

If the Intelligent Equipment solution was ordered with the chiller, rooftop, or air handling unit, it shipped with the M2M, EMM, CT's, Powers Supply and Fuse Block already installed in the control enclosure, and associated interconnections already made. On chillers, the antenna bases are shipped inside the control enclosure, along with the antenna flags and Ethernet adapter. The coaxial cable for the antenna bases must be routed to the control enclosure once the antenna base is installed in the field. If needed, the Ethernet adapter is field-installed. For rooftop units, the antenna bases are pre-installed, antenna flags and Ethernet adapter ship inside the schematics envelope for the unit. The antenna(s) and Ethernet adapter are field-installed.

Retrofit IE on Chillers

When the Intelligent Equipment solution is ordered for retrofit installation, the following components will ship loose:

- M2M Gateway
- Power Supply
- EMM
- Fuse Block (with 5A Fuses pre-installed).
- Antenna flags and bases
- Three Current Transformers (CT’s)
- 3’ USB cable
- 6’ Ethernet Patch cable
- USB-to-Ethernet Adapter
- 6” EMM Wiring Harness
- 6’ EMM Wiring Harness
- Hardware packet, including (1) patch plate with two watertight grommets pre-installed
- (2) 5/8” bushings
- (1) grounding harness
- (1) 3-wire voltage harness, wire ties, wire tie hangers
- (12) self-tapping sheet metal screws
- (1) section of 600V-rated heat shrink tubing.

Upon receiving, verify that all components are present, and notify the supplier of any shortage.

Retrofit IE on Rooftop, or Air Handling Unit

When the Intelligent Equipment solution is ordered for retrofit installation on a rooftop or air handling unit, the following components will ship loose:

- Two Mounting brackets. One bracket contains the M2M Gateway and power supply, the other contains the EMM and fuse block (with 5A Fuses pre-installed).
- Antenna flags and bases
- Three Current Transformers (CT’s)
- 3’ USB cable
- 6’ Ethernet Patch cable
- USB-to-Ethernet Adapter
- 6” EMM Wiring Harness
- 6’ EMM Wiring Harness
- Hardware packet, including (1) patch plate with two watertight grommets pre-installed
- (2) 5/8” bushings
- (1) grounding harness
- (1) 3-wire voltage harness, wire ties, wire tie hangers
- (12) self-tapping sheet metal screws
- (1) section of 600V-rated heat shrink tubing.

Upon receiving, verify that all components are present, and notify the supplier of any shortage.

Necessary Tools

- Corded (or powerful cordless) Drill
- 7/8” Step Drill Bit (suitable for drilling through metal enclosure)
- 1/4” Drill Bit for wire tie hangers (suitable for drilling through metal enclosure)
- 3/32” Drill Bit for pilot holes (suitable for drilling through metal enclosure)
- Multimeter
- Wire strippers
- SAE hex wrench set
- Precision screwdriver set
- #2 Phillips screwdriver
- #2 Flat screwdriver
- 5/16” Nut driver
- Hammer
- Pliers
- Small carpenter square (8” × 12”)
- Level
- Clear silicone sealant
Retrofit Installation

**DANGER**

Electric shock hazard. Can cause personal injury or equipment damage.

Prior to installing Intelligent Equipment hardware, power must be removed from the unit. This means removing power at the breaker panel serving the unit, and following proper lockout/tagout procedures at said breaker panel for the duration of the install. Power should not be reapplied until all electrical interconnections have been made and verified.

This equipment must be properly grounded. Connections and service to the MicroTech III Air-Cooled Chiller Controller, Packaged Rooftop or Outdoor Air Handling unit, Machine-to-Machine Gateway and Energy Management Module must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

**CAUTION**

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

**WARNING**

Sharp edges on sheet metal and fasteners can cause personal injury. This equipment must be installed, operated, and serviced only by an experienced installation company and fully trained personnel.

**CAUTION**

To avoid damaging wires or components, verify clearance in and around the point of penetration prior to any drilling.

During any drilling, ensure that resultant metal shavings are not allowed to contact unit electronics.

Subsequent to any drilling, remove all resulting metal shavings from the control enclosure.

**NOTICE**

For Cellular and Wi-Fi installations, do not power the M2M Gateway until the antenna has been installed and connected.
Chiller Installation Instructions

Installing M2M Gateway

Prior to installing any Intelligent Equipment components, power must be removed from the unit. Power must be removed at the breaker panel serving the unit, and proper lockout/tagout procedures should be followed for the duration of the install. After removing unit power at the breaker panel, the installer must verify the absence of power at the unit using a multimeter. Only if power has been verified absent, should the technician begin the install. The retrofit kit is shipped with the M2M gateway shipped loose.

The M2M gateway must be installed inside the unit control panel. The installation location will vary depending on the unit model and size of the control enclosure (see Figure 1 through Figure 6 for correct component locations on AGZ and AWV models). On AWS models, locate IE Hardware as space allows within control enclosure. Figure 7 and Figure 8 provide the typical layout of AWS small and large enclosures. Begin by positioning the M2M gateway on the backplane of the enclosure and marking the screw holes. Next, drill pilot holes, through the marks just created, using a 7/64” drill bit. Finally, attach the M2M gateway to the backplane using (4) of the provided #6 sheet metal screws (5/16” head). Install the ring terminal on one end of the M2M ground conductor under one of the(4) sheet metal screws (Figure 9). The M2M ground conductor has ring terminals at both ends. Termination for the other end of this conductor is described in the section entitled, Connection of M2M and EMM to Ground on page 16.

Figure 1: Component Locations – AGZ-D and E Small Panel

Figure 2: Component Locations – AGZ-D and E Medium Panel
Installing Energy Management Module

Prior to installing any Intelligent Equipment components, power must be removed from the unit. Power must be removed at the breaker panel serving the unit, and proper lockout/tagout procedures should be followed for the duration of the install. After removing unit power at the breaker panel, the installer must verify the absence of power at the unit using a multimeter. Only if power has been verified absent, should the technician begin the install. The retrofit kit is shipped with the EMM shipped loose. The EMM must be installed inside the unit control panel.

The installation location will vary depending on the unit model and size of the control enclosure (see Figure 1 through Figure 6 for correct component locations on AGZ and AWV models). On AWS models, locate Intelligent Equipment hardware as space allows within the control enclosure. Figure 7 and Figure 8 provide a typical layout of AWS small and large enclosures. Begin by positioning the EMM on the backplane of the enclosure and marking the screw holes. Next, drill pilot holes, through the marks just created, using a 7/64” drill bit. Finally, attach the EMM to the backplane using (4) of the provided #6 sheet metal screws (5/16” head).

Installing Power Supply

Prior to installing any Intelligent Equipment components, power must be removed from the unit. Power must be removed at the breaker panel serving the unit, and proper lockout/tagout procedures should be followed for the duration of the install. After removing unit power at the breaker panel, the installer must verify the absence of power at the unit using a multimeter. Only if power has been verified absent, should the technician begin the install.

The retrofit kit is shipped with the power supply shipped loose. The power supply must be installed inside the unit control panel. The installation location will vary depending on the unit model and size of the control enclosure (see Figure 1 through Figure 6 for correct component locations on AGZ and AWV models). On AWS models, locate Intelligent Equipment hardware as space allows within the control enclosure. Figure 7 and Figure 8 provide a typical layout of AWS small and large enclosures.

Begin by positioning the power supply on the backplane of the enclosure and marking the screw holes. Next, drill pilot holes, through the marks just created, using a 7/64” drill bit. Finally, attach the power supply to the backplane using (2) of the provided #6 sheet metal screws (5/16” head).
Installing Fuse Block

Prior to installing any Intelligent Equipment components, power must be removed from the unit. Power must be removed at the breaker panel serving the unit, and proper lockout/tagout procedures should be followed for the duration of the install.

After removing unit power at the breaker panel, the installer must verify the absence of power at the unit using a multimeter. Only if power has been verified absent, should the technician begin the install. The retrofit kit is shipped with the fuse block shipped loose. The fuse block must be installed inside the unit control panel. The installation location will vary depending on the unit model and size of the control enclosure (see Figure 1 through Figure 6 for correct component locations on AGZ and AWV models). On AWS models, locate Intelligent Equipment hardware as space allows within the control enclosure. Figure 7 and Figure 8 provide a typical layout of AWS small and large enclosures.

Begin by removing the fuse covers and fuses from the fuse block (Figure 10). Prior to removal, make note of fuse orientation within the fuse block. Then, position the fuse block on the backplane of the enclosure and mark the screw holes. Next, drill pilot holes, through the marks just created, using a 1/8" drill bit.

Finally, attach the fuse block to the backplane using (2) of the provided #8 sheet metal screws (5/16" head). Fuses can be reinstalled, but the covers should remain off for subsequent install of necessary wiring.

Control Cabinet Penetrations

Only the antenna cable(s) must be routed to the outside of the control enclosure; all other terminations remain within the control enclosure. This is done using a specific available knockout. The location of the correct knockout will vary depending on the unit model and size of the control enclosure (see Figure 11 through Figure 16 for knockouts locations on AGZ and AWV models). On AWS models, field verify an available knockout. Figure 15 and Figure 16 provide the typical layout of AWS small and large enclosures.

First, determine the correct knockout to remove, then remove it using a hammer, flat screwdriver and pliers. Use the hammer to gently tap the flat blade of a screwdriver into the open slot of the knockout. Once enough separation is gained between the knockout and the panel, use the pliers to fully remove the knockout. Insert the provided 0.875" grommet into the control enclosure from the outside. The knockout is now prepared for routing of the antenna cable(s).

![Figure 10: Fuse Block with Covers and Fuses Removed](image)

![Figure 11: AGZ Small Enclosure Knockout Location (Rear of Enclosure)](image)

![Figure 12: AGZ Medium Enclosure Knockout Location (Rear of Enclosure)](image)
Figure 13: AGZ Large Enclosure Knockout Location (Rear of Enclosure)

Figure 14: AWV Large Enclosure Knockout Location (Rear of Enclosure)

Figure 15: AWS Small Enclosure Knockout Location (Rear of Enclosure)

Figure 16: AWS Large Enclosure Knockout Location (Rear of Enclosure)
### Wiring Interconnections

<table>
<thead>
<tr>
<th>DANGER</th>
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<tbody>
<tr>
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</table>

Prior to installing Intelligent Equipment hardware, power must be removed from the unit. This means removing power at the breaker panel serving the unit, and following proper lockout/tagout procedures at said breaker panel for the duration of the install. Power should not be reapplied until all electrical interconnections have been made and verified.

This equipment must be properly grounded. Connections and service to the MicroTech III Air-Cooled Chiller, Packaged Rooftop, or Outdoor Air Handling Unit Controller, Machine-to-Machine Gateway and Energy Management Module must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

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<tbody>
<tr>
<td>Static sensitive components. Can cause equipment damage.</td>
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</table>

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

### M2M Connection to MTIII

The M2M Gateway is connected to the MicroTech III unit controller via Ethernet. Connect one end of the provided 6’ Ethernet Patch cable to the M2M port marked, “ETH”, and the other end to the MicroTech III Unit controller port marked, “TIP” (Figure 17).

### M2M Connection to EMM

The M2M Gateway is connected to the EMM via USB. Connect the type-A end of the provided 3’ USB cable to the M2M port marked, “USB1”, and the type-B end of the same cable to the USB port of the EMM (Figure 18).

**Figure 17: ‘ETH’ and ‘TIP’ Ports**

**Figure 18: USB Connections**
Connection of Power Supply

The M2M Gateway is powered by a 120VAC (primary) to 24VDC (secondary) power supply. The 24 VDC connection is made via a pre-fabricated, keyed plug coming from the low voltage end of the power supply. Connect this plug to the M2M Gateway receptacle marked, "Power Input" (Figure 19).

The 120VAC cable has the jacket and insulation pre-stripped, with the ends of both the Line and Neutral wires tinned. On a MicroTech III AGZ-D or AGZ-E unit, connect the Line (brown) conductor to terminal TB1-11B and the Neutral (blue) conductor to terminal TB1-32B (Figure 20). On a MicroTech III AWV or AWS unit, connect the Line (brown) conductor to terminal MQ-11 and the Neutral (blue) conductor to terminal MQ-17 (Figure 21).

Figure 19: M2M Power Input

Connection of EMM to Split-Core CT's

The high voltage side of the EMM has a hinged cover, which must be opened. First, remove the two installation screws (Figure 22), then flip the cover open. The EMM uses an open style hinge, so it may be easier to completely remove the hinged door while installing conductors.

The CT's have built-in output conductors, which must be connected to the EMM. Each black conductor must be connected to an EMM terminal labeled, “CT”, while each white conductor must be connected to the corresponding terminal labeled, “A”, “B”, or “C”. The two conductors from each CT must be connected to the same terminal set, i.e. – “CT” and “A”, “CT” and “B”, or “CT” and “C”. For each CT, the white wire must go to terminal labeled ‘CT’ and the black wire must go to the associated lettered terminal (Figure 23).

Figure 20: AGZ-D and AGZ-E 120VAC Wiring

Figure 21: AWV and AWS 120VAC Wiring

Figure 22: Hinged Cover Screw Locations

Figure 23: Connection of EMM to CT's
Connection of EMM to Rogowski Coil CT’s

Chillers with larger incoming power bundles will require the use of a flexible CT called a Rogowski coil. The connection of the flexible CT is similar to that of a split-core CT. The Rogowski coil CT’s have built-in output conductors, which must be connected to the EMM. Insert the white conductor from the Rogowski coil CT on Line 1 into the CT_A+ terminal, and the green conductor from the Rogowski coil CT on Line 1 into the CT_A- terminal. Next, insert the white conductor from the Rogowski coil CT on Line 2 into the CT_B+ terminal, and the green conductor from the Rogowski coil CT on Line 2 into the CT_B- terminal. Finally, insert the white conductor from the Rogowski coil CT on Line 3 into the CT_C+ terminal, and the green conductor from the Rogowski coil CT on Line 3 into the CT_C- terminal. Figure 24 provides an example of these connections.

Connection of Rogowski Coil CT’s to Power Supply

Unlike a standard split-core CT, the Rogowski coil CT’s have a built-in amplifier/integrator that must be powered. You will receive a 24VAC to 24VDC power supply with a terminal strip, which is used to power the three Rogowski coil CT amplifiers. You must first secure the terminal strip to the control panel backplane using the provided sheet metal screws. Then, connect the Red wire from each Rogowski coil CT to the Vout (24VDC+) terminal block, and the Black wire from each Rogowski coil CT to the GND (Vout) terminal block (Figure 25). The power supply is provided with a length of cable for connecting it to 24VAC in the unit control enclosure. On an AGZD or AGZE chiller, terminal Vin on the power supply should be connected to terminal TB2-42 or TB2-43, and terminal GND (Vin) on the power supply should be connected to terminal TB2-81, TB2-83, or TB2-84 (Figure 27). On an AWV chiller, terminal Vin on the power supply should be connected to terminal MS-10, and terminal GND (Vin) on the power supply should be connected to terminal MS-20 (Figure 28). On an AWS chiller, terminal Vin on the power supply should be connected to terminal MQ-10, and terminal GND (Vin) on the power supply should be connected to terminal MQ-20 (Figure 29).

NOTE: Always confirm terminal designations on unit As-Built wiring diagram.

Figure 24: Connection of EMM to Rogowski Coil CT’s

Figure 25: Rogowski Coil Terminal Block
Installing Spilt-Core CT’s

Current Transformers (CT’s) are split-core type, to make installation easier. Snap split-core CT connected to EMM terminal CT_A on phase L1, snap split-core CT connected to EMM terminal CT_B on phase L2, and snap split-core CT connected to EMM terminal CT_C on phase L3 (Figure 26). Ensure that the “Load” indicator on the CT is oriented correctly.

Figure 26: CT Installation

Installing Rogowski Coil CT’s

Snap the Rogowski Coil CT connected to EMM terminal CT_A on phase L1, the Rogowski Coil CT connected to EMM terminal CT_B on phase L2, and the Rogowski Coil CT connected to EMM terminal CT_C on phase L3 (Figure 30). Ensure that the “Load” indicator on the CT is oriented correctly. The molded arrow on the snap of the CT should be pointing toward the load.

Figure 27: Rogowski Coil Power Supply Connection – AGZ

Figure 28: Rogowski Coil Power Supply Connection – AWV

Figure 29: Rogowski Coil Power Supply Connection – AWS

Figure 30: Rogowski Coil Installation
Connection of EMM to Line Voltage

The EMM is connected to Line Voltage through the Fuse Block. Begin by removing the fuse covers and fuses from the Fuse Block. Prior to removal, make note of fuse orientation within the fuse block. Next, using the provided 6” wiring harness, connect the “VinA” (Tan), “VinB” (Orange), and “VinC” (Violet) terminals on the EMM to the “Load” terminals on the Fuse Block (Figure 31).

If needed, remove the plastic protective shield from Power Distribution Block 1 (PD1). Using the provided 6’ wiring harness, connect the corresponding “Line” terminals on the Fuse Block to the control panel (PD1) terminals “T1”, “T2”, and “T3”, such that EMM terminal “VinA” (Tan) is connected to PD1-T1, “VinB” (Orange) is connected to PD1-T2, and “VinC” (Violet) is connected to PD1-T3 (Figure 32).

Connection of M2M and EMM to Ground

One end of the M2M ground conductor should already be connected to the M2M case (see section entitled, “Installing M2M Gateway”). Connect the tinned end of the EMM ground conductor to the “GND” terminal on the EMM itself (Figure 33). Connect the free ring terminals for both the M2M and EMM to the nearest available grounding lug in the control enclosure (Figure 34).

Once all connections are made to the line voltage side of the EMM, close the hinged cover, and reinstall the screws. Figure 35 depicts an EMM with all high voltage terminations made and the hinged cover reinstalled.
Antenna Installation

**DANGER**

Electric shock hazard. Can cause personal injury or equipment damage.

Prior to installing Intelligent Equipment hardware, power must be removed from the unit. This means removing power at the breaker panel serving the unit, and following proper lockout/tagout procedures at said breaker panel for the duration of the install. Power should not be reapplied until all electrical interconnections have been made and verified.

This equipment must be properly grounded. Connections and service to the MicroTech III Air-Cooled Chiller, Packaged Rooftop, or Outdoor Air Handling Unit Controller, Machine-to-Machine Gateway and Energy Management Module must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

**CAUTION**

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

**WARNING**

Sharp edges on sheet metal and fasteners can cause personal injury. This equipment must be installed, operated, and serviced only by an experienced installation company and fully trained personnel.

Mounting

The antennas provided with the Daikin Applied Intelligent Equipment solution (Figure 36) are omni-directional, and utilize a swiveling base that allows the antenna to be oriented to avoid interference from structures or other antennas. For initial installation, it is recommended to install the antenna on top of the chiller, rooftop, or air handling unit with enough clearance from the edge to avoid accidental contact or damage. The antenna is held in place by its magnetic base. You will find more information about aiming antennas in the, "Cellular Configuration", "Wi-Fi Configuration", and “Troubleshooting" sections of this document.

Wiring of Antennas

As described previously, the antenna cable must be fed from the outside of the unit through the control enclosure and up to the mounting bracket with the M2M Gateway, EMM, power supply, and fuse block. The connection is made by screwing the SMA coaxial connector onto the appropriate M2M SMA coaxial connector; “3G/GPRS” for cellular or “WLAN” for Wi-Fi. (Figure 37).

LAN Installation

**LAN Connection**

If using the local area network (LAN) for cloud connectivity, a USB-to-Ethernet Adapter must be used for connection to the M2M Gateway. To complete the installation, connect the Ethernet patch cable from the network switch to the Ethernet end of the USB-to-Ethernet Adapter provided with the IE kit. Next, connect the USB end of the USB-to-Ethernet Adapter to the port labeled, “USB2”, on the M2M Gateway (Figure 38). NOTE: the M2M Gateway will not communicate with the cloud if the USB-to-Ethernet Adapter is connected to the incorrect USB port.
Rooftop Installation Instructions

Installing Mounting Brackets

Prior to installing the mounting brackets, power must be removed from the unit. Power must be removed at the breaker panel serving the unit, and proper lockout/tagout procedures should be followed for the duration of the install. After removing unit power at the breaker panel, the installer must verify the absence of power at the unit using a multimeter. Only if power has been verified absent, should the technician begin the install.

The retrofit kit is shipped with two mounting brackets: one bracket contains the M2M Gateway and power supply, the other contains the EMM and fuse block (with 5A Fuses pre-installed). In a retrofit scenario, these brackets must be installed inside the unit control panel. For MPS and DPS units, the brackets are designed for installation inside of the main unit control panel, mounted to the top of the unit controller section (see Figure 39 for preferred locations) using the provided sheet metal screws (5/16” head). The bracket containing the M2M Gateway should be mounted to the left of the enclosure, and the bracket containing the EMM should be mounted to the right side of the enclosure (Figure 39). For RPS, RPR, RDT, RFS, RDS and RAH units, the M2M bracket is designed for installation on the inside of the lower, left internal enclosure door (Figure 40), and the EMM bracket is designed for installation on the inside of the lower, right internal enclosure door (Figure 41).

Care must be taken to ensure that the mounting brackets are not installed in such a way as to interfere with closing of the control panel door, or to cover any panel knock-outs. It may be useful to mark the screw holes of the bracket, and drill small pilot holes, before screwing the brackets firmly to the top of the control enclosure.

In some enclosure configurations, particularly with early DPS and MPS units, the control enclosure layout and dimensions may not allow for the desired mounting locations. In these situations, the installer should use discretion in determining suitable replacement locations within the control enclosure, paying special attention to the following limitations:

- When routing wiring through the control enclosure, care must be taken to maintain a minimum of 5 inches of clearance between all cables and conductors with 300V-rated insulation or less and areas of the control enclosure containing higher voltage components and conductors, such as 575V.
- Avoid routing communication cables (Cat 5e, USB, etc.) near sources of line voltage.

For reference, Figure 42 shows suitable alternative locations in an early DPS unit with a smaller control enclosure footprint.
**Wire Routing**

<table>
<thead>
<tr>
<th><strong>DANGER</strong></th>
<th>Electric shock hazard. Can cause personal injury or equipment damage.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prior to installing Intelligent Equipment hardware, power must be removed from the unit. This means removing power at the breaker panel serving the unit, and following proper lockout/tagout procedures at said breaker panel for the duration of the install. Power should not be reapplied until all electrical interconnections have been made and verified.</td>
</tr>
<tr>
<td></td>
<td>This equipment must be properly grounded. Connections and service to the MicroTech III Commercial Packaged Rooftop Unit Controller, Applied Packaged Rooftop, or Commercial Outdoor Air Handling Unit, Machine-to-Machine Gateway and Energy Management Module must be performed only by personnel knowledgeable in the operation of the equipment being controlled.</td>
</tr>
</tbody>
</table>

| **WARNING** | Care must be taken to ensure a minimum of 5 inches of clearance between all cables and conductors with 300V-rated insulation or less and areas of the control enclosure containing higher voltage components and conductors. |

| **NOTICE** | In the event that 300V or lower rated cables and conductors cannot be practically isolated from 600V-rated cables and conductors, a section of 600V-rated shrink wrap tubing is included in the installation kit. This tubing can be cut-to-fit and placed over the lower voltage rated cables and conductors to increase their rating to 600V. |

When routing wiring through the control enclosure, care must be taken to maintain a minimum of 5 inches of clearance between all cables and conductors with 300V-rated insulation or less and areas of the control enclosure containing higher voltage components and conductors, such as 575V. For practical purposes, this means routing all cables and conductors from the high-voltage side of the EMM (Figure 43) away from any cables and conductors connected to the M2M Gateway.

*Figure 43: High Voltage Side of EMM*
Figure 44 indicates the expected routing for a typical Maverick II unit, Figure 45 indicates the expected routing for a typical Rebel unit, and Figure 46 & Figure 47 indicate the expected routing for a typical RoofPak (RPS, RPR, RDT, RFS, RDS or RAH) unit. In retrofit situations, the installer should use discretion in determining suitable routing within the control enclosure, in order to ensure the required 5-inch clearance between all cables and conductors with 300V-rated insulation or less and areas of the control enclosure containing higher voltage components and conductors. In RoofPak installations, all non-600V-rated wires (Ethernet, Coax, USB) must be wrapped in the 600V-rated insulation sleeve provided with the retrofit kit.

Figure 44: Typical Maverick II Wire Routing

Figure 45: Typical Rebel Wire Routing

Figure 46: Typical RoofPak Wire Routing - Left-Side of Enclosure

Figure 47: Typical RoofPak Wire Routing - Right-Side of Enclosure
Control Cabinet Penetrations

Only the antenna cable(s) must be routed to the outside of the control enclosure. All other terminations remain within the control enclosure. To limit the risk of moisture damage, the required external penetration should be made in the lower part of the left stile of the control enclosure for DPS and MPS units (Figure 48), or out the condenser box section of RoofPak units (Figure 49).

The retrofit kit arrives with a patch plate containing two watertight grommets pre-installed. You have several options for using this plate. In most cases, only a single antenna will be used, so one of the two grommets can be removed from the patch plate and discarded (Figure 50).

In this case, only a single penetration will be made through the control enclosure. If two antennas are to be used, both grommets will remain in place, and two penetrations will be required. Alternatively, the grommets can be removed from the patch plate entirely and installed directly into the sheet metal of the control enclosure. Regardless of which method is used, it is important that silicone sealant be used to seal all penetrations. If two antennas are to be used, it is recommended to remove the grommets and use the patch plate as a template for marking the two penetration prior to drilling. When setting the patch plate as a template, use a carpenter square and level to ensure that the patch plate is aligned squarely with the unit control enclosure.

On the outside of the unit enclosure, drill a 7/8" hole using a step drill bit, centered from right to left, no more than 6" from the bottom of the stile. Drill no deeper than necessary to ensure the 7/8" hole is created. After doing this, a smaller diameter hole should be present on the inside of the enclosure. Again using the step drill bit, drill this hole on the inside of the enclosure to a 5/8" diameter. Drill no deeper than necessary to ensure the 5/8" hole is created. Install the provided 5/8" bushing (Figure 51) on the inside of the enclosure within the newly drilled hole. The bushing should snap into place on the sheet metal.

You will install the patch plate on the outside of the enclosure, using the self-tapping sheet metal screws included in the hardware kit. Prior to installation, remove the protective plastic from the patch plate. Apply a bead of silicone sealant around the perimeter of the back side of the patch plate, ensuring that all potential points of moisture entry are covered. Once the plate is located as desired, press the grommet(s) into the 7/8" hole created previously. Again, use a carpenter square and level to ensure that the patch plate is aligned squarely with the unit control enclosure. The grommet(s) should snap into place on the sheet metal. Using the drill and nut driver, screw the patch plate in place using the four pre-drilled mounting holes (Figure 52).

Next, temporarily attach the antenna to the top of the air-handling unit, directly above the stile. The antenna’s coaxial cable is permanently affixed to the base, so you must feed the free end through the grommet (from outside inward), and route it to the top of the control enclosure, being careful to avoid sharp edges or pinch-points within the cabinet. Loosely coil the excess coaxial cable, and place it on top of the wire trough above the unit controller (it will be connected later during the installation).
Wiring Interconnections

**DANGER**

Electric shock hazard. Can cause personal injury or equipment damage.

Prior to installing Intelligent Equipment hardware, power must be removed from the unit. This means removing power at the breaker panel serving the unit, and following proper lockout/tagout procedures at said breaker panel for the duration of the install. Power should not be reapplied until all electrical interconnections have been made and verified.

This equipment must be properly grounded. Connections and service to the MicroTech III Commercial Packaged Rooftop Unit Controller, Applied Packaged Rooftop, or Commercial Outdoor Air Handling Unit, Machine-to-Machine Gateway and Energy Management Module must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

**CAUTION**

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

**M2M Connection to MTIII**

The M2M Gateway is connected to the MicroTech III unit controller via Ethernet. Connect one end of the provided 6’ Ethernet Patch cable to the M2M port marked, “ETH”, and the other end to the MicroTech III Unit controller port marked, “TIP” (Figure 53).

**Figure 53: ETH and TIP Ports**

---

**M2M Connection to EMM**

The M2M Gateway is connected to the EMM via USB. Connect the type-A end of the provided 3’ USB cable to the M2M port marked, “USB1”, and the type-B end of the same cable to the USB port of the EMM (Figure 54).

**Figure 54: USB Connections**

---

**Connection of Power Supply**

The M2M Gateway is powered by a 120VAC (primary) to 24VDC (secondary) power supply. The 24 VDC connection is made via a pre-fabricated, keyed plug coming from the low voltage end of the power supply. Connect this plug to the M2M Gateway receptacle marked, “Power Input” (Figure 55).

**Figure 55: M2M Power Input**
The 120VAC cable has the jacket and insulation pre-stripped, with the ends of both the Line and Neutral wires tinned. On a MicroTech III Rebel unit, connect the Line (brown) conductor to terminal TB1-1 and the Neutral (blue) conductor to terminal TB1-3 (Figure 56).

On a MicroTech III Maverick II unit, connect the Line (brown) conductor to terminal TB1A-1, 2, 3, or 4 and the Neutral (blue) conductor to terminal TB1A-5, 6, 7, 8, or 9 (Figure 57).

On a MicroTech III RPS, RPR, RDT, RFS, RDS or RAH unit, connect the Line (brown) conductor to terminal TB1A-1, 2, 3, or 4, and the Neutral (blue) conductor to terminal TB1A-5, 6, 7, 8, or 9 (Figure 58).

Figure 56: Typical MicroTech III Rebel 120VAC Wiring

![Typical MicroTech III Rebel 120VAC Wiring](image1)

Figure 57: Typical MicroTech III Maverick II 120VAC Wiring

![Typical MicroTech III Maverick II 120VAC Wiring](image2)

Figure 58: Typical MicroTech III RoofPak Unit 120VAC Wiring

![Typical MicroTech III RoofPak Unit 120VAC Wiring](image3)
Connection of EMM to CT’s

The high voltage side of the EMM has a hinged cover, which must be opened. First, remove the two installation screws (Figure 59), then flip the cover open. The EMM uses an open style hinge, so it may be easier to completely remove the hinged door while installing conductors.

The CT’s have built-in output conductors, which must be connected to the EMM. Each black conductor must be connected to an EMM terminal labeled, “CT”, while each white conductor must be connected to the corresponding terminal labeled, “A”, “B”, or “C”. The two conductors from each CT must be connected to the same terminal set, i.e. – “CT” and “A”, “CT” and “B”, or “CT” and “C”. For each CT, the white wire must go to terminal labeled ‘CT’ and the black wire must go to the associated lettered terminal (Figure 60).

Installing CT’s

Current Transformers (CT’s) are split-core type, to make installation easier. Snap split-core CT connected to EMM terminal CT_A on phase L1, snap split-core CT connected to EMM terminal CT_B on phase L2, and snap split-core CT connected to EMM terminal CT_C on phase L3 (Figure 61). Ensure that the “Load” indicator on the CT is oriented correctly.

Connection of EMM to Line Voltage

The EMM is connected to Line Voltage through the Fuse Block pre-installed on the mounting bracket. Using the provided 6” wiring harness, connect the “VinA” (Tan), “VinB” (Orange), and “VinC” (Violet) terminals on the EMM to the “Load” terminals on the Fuse Block (Figure 62).
For DPS and MPS Units, use the provided 6’ wiring harness, to connect the corresponding “Line” terminals on the Fuse Block to the control panel Power Block 1 (PB1) terminals “T1”, “T2”, and “T3”, such that EMM terminal “VinA” (Tan) is connected to PB1-T1, “VinB” (Orange) is connected to PB1-T2, and “VinC” (Violet) is connected to PB1-T3 (Figure 63).

For RoofPak Units, use the provided 6’ wiring harness to connect the “Line” terminals on the Fuse Block to the control panel Power Block 11 (PB11) terminals “T1”, “T2”, and “T3”, such that EMM terminal “VinA” (Tan) is connected to PB11-T1, “VinB” (Orange) is connected to PB11-T2, and “VinC” (Violet) is connected to PB11-T3 (Figure 64). Once all connections are made to the line voltage side of the EMM, close the hinged cover, and reinstall the screws. Figure 65 depicts an EMM with all high voltage terminations made and the hinged cover reinstalled.

![Figure 63: DPS and MPS Fuse Block Connected to Line Voltage](image1)

**Figure 63: DPS and MPS Fuse Block Connected to Line Voltage**

![Figure 64: RoofPak Fuse Block Connection to Line Voltage](image2)

**Figure 64: RoofPak Fuse Block Connection to Line Voltage**

![Figure 65: EMM Following Reinstallation of Hinged Cover](image3)

**Figure 65: EMM Following Reinstallation of Hinged Cover**

**Connection of M2M and EMM to Ground**

Both the M2M and EMM arrive with their respective ground conductors connected at the device. In the case of the M2M, one end of the ground conductor is connected to the mounting bracket, while in the case of the EMM, one end of the ground conductor is connected to the “Safety” terminal on the EMM itself. For both the M2M and EMM, the “free” end of the ground conductor should be connected to the nearest available grounding lug in the control enclosure.
Antenna Installation

DANGER

Electric shock hazard. Can cause personal injury or equipment damage.

Prior to installing Intelligent Equipment hardware, power must be removed from the unit. This means removing power at the breaker panel serving the unit, and following proper lockout/tagout procedures at said breaker panel for the duration of the install. Power should not be reapplied until all electrical interconnections have been made and verified.

This equipment must be properly grounded. Connections and service to the MicroTech III Commercial Packaged Rooftop Unit Controller, Commercial Packaged Rooftop, Applied Packaged Rooftop, or Commercial Outdoor Air Handling Unit, Machine-to-Machine Gateway and Energy Management Module must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

CAUTION

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

CAUTION

Sharp edges on sheet metal and fasteners can cause personal injury. This equipment must be installed, operated, and serviced only by an experienced installation company and fully trained personnel.

Mounting

The antennas provided with the Intelligent Equipment solution by Daikin (Figure 66) are omni-directional, and utilize a swiveling base that allows the antenna to be oriented to avoid interference from structures or other antennas. For initial installation, it is recommended to install the antenna on top of the rooftop unit, with enough clearance from the edge to avoid accidental contact or damage. The antenna is held in place by its magnetic base. You will find more information about aiming antennas in the sections, Cellular Configuration on page 17, Wi-Fi Configuration on page 19, and Troubleshooting on page 24 of this document.

Wiring of Antennas

As described previously, the antenna cable must be fed from the outside of the unit through the control enclosure and up to the mounting bracket with the M2M Gateway, EMM, power supply, and fuse block. The connection is made by screwing the SMA coaxial connector onto the appropriate M2M SMA coaxial connector; “3G/GPRS” for cellular or “WLAN” for Wi-Fi. (Figure 67).
Cellular Configuration

The following procedures should be used to configure the Intelligent Equipment solution for Cellular connectivity:

1. Mount and connect the wireless antenna per the instructions included in document section, Antenna Installation on page 17.

2. Using a laptop computer and Ethernet cable, connect to the “ETH” port of the M2M Gateway (you will need to temporarily disconnect the Ethernet cable between the M2M Gateway and the MicroTech III controller, to make use of the “ETH” port on the M2M Gateway).
   a. The Cellular strength of the M2M Gateway is verified using an HTML Interface page in an HTTP server.
   b. In order to access this page, your computer must be on the same subnet as the M2M Gateway, which is shipped set to a default IP subnet mask (**255.255.0.0**) and IP address (**https://172.31.255.1**). You must change the computer’s network settings to match the subnet (the signal strength verification process is the same regardless of the operating system on your computer).
   c. Navigate to your laptop’s Local Area Connection settings screen and change the IP subnet mask to **255.255.0.0**, and the IP address to be compatible with the default M2M Gateway IP address listed above (example: 172.31.255.7). For more information on how to change your computer’s IP settings, consult the Operating System’s “Help” files.
   d. Temporarily disable the wireless adapter(s) on the computer, as these may prevent accessing the HTML Interface page.

3. Open a web browser page and type, **https://172.31.255.1**, then press enter.
   a. When prompted, enter the User Name: “**service**”
   b. Enter the unique password that was provided with the Gateway hardware and press ENTER.
   c. This opens the Gateway home page (Figure 68 on page 28).

4. Click the ‘**Status**’ tab
   a. Select the ‘**WWAN Modem**’ tab
   b. Under “Signal Quality, verify cellular signal strength (Figure 69).

5. Adjust antenna as necessary to establish a strong cellular connection
   a. For reliable operation, signal quality and power should both be in the good or excellent range.
   b. As the antenna is adjusted, be mindful that signal strength is impacted by structures or other antennas. As much as practically possible, make efforts to avoid such interference while adjusting the antenna.

6. Once a strong cellular connection is obtained, close the web browser, and disconnect the Ethernet cable between the laptop and M2M Gateway.

7. Reconnect the Ethernet cable between the M2M Gateway and the MicroTech III controller.

8. Feed excess antenna cable into the control enclosure, then tighten waterproof grommet.

9. Add a bead of silicone around the perimeter of the waterproof grommet penetration into the control enclosure.

10. On inside of enclosure, secure excess antenna cable using zip ties.
Figure 68: M2M Gateway Home Page

**System Information**

- **Firmware**: Wind River Intelligent Device Platform - With Webif Extensions 2.0
- **Kernel**: Linux 3.4.43-glibc-WRS.0.1.8_standard #13 SMP PREEMPT Mon Jan 27 18:23:21 UTC 2014
- **MAC**: 00:60:0c:31:67:94
- **Device**: Intel Atom Common
- **Username**: root
- **Web mgt. console**: Webif
- **Version**: 0.3+svn4987

Figure 69: Verify Cellular Signal Strength

**WWAN Modem Status**

**Modem Device Information**
- Connection Device: /dev/ttyACM0
- Supported Protocol: 3g
- Manufacturer: Telit
- Vendor ID: 1bc7
- Product: HE010
- Product ID: 0021
- Serial Number: 351579050700333
- Revision: 12.00.024

**SIM/HICC Card Information**
- APN: wap.cingular
- IMSI: 310170801203679
- Operator: AT&T
- Operator Code: 310410

**Signal Quality**

<table>
<thead>
<tr>
<th>Signal Quality:</th>
<th>Unreliable</th>
<th>Workable</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (dBm):</td>
<td>-113 to -95</td>
<td>-93 to -85</td>
<td>-83 to -75</td>
<td>-73 to -51</td>
</tr>
<tr>
<td></td>
<td>0 to 0.9</td>
<td>10 to 14</td>
<td>15 to 19</td>
<td>20 to 31</td>
</tr>
</tbody>
</table>

About Intelligent Device Platform  About Webif

Apply Changes « Clear Changes « Review Changes «
Wi-Fi Configuration

The following procedures should be used to configure the Intelligent Equipment solution for Wi-Fi connectivity:

1. Mount and connect the wireless antenna per the instructions included in document section, Antenna Installation on page 17.

2. Using a laptop computer and Ethernet cable, connect to the “ETH” port of the M2M Gateway (you will need to temporarily disconnect the Ethernet cable between the M2M Gateway and the MicroTech III controller, to make use of the “ETH” port on the M2M Gateway).
   a. The Wi-Fi settings of the M2M Gateway are configured using HTML Interface pages in an HTTP server.
   b. In order to access these pages, your computer must be on the same subnet as the M2M Gateway, which is shipped set to a default IP subnet mask (255.255.0.0) and IP address (https://172.31.255.1). You must change the computer’s network settings to match the subnet (the Wi-Fi configuration process is the same regardless of the operating system on your computer).
   c. Navigate to your laptop’s Local Area Connection settings screen and change the IP subnet mask to 255.255.0.0, and the IP address to be compatible with the default M2M Gateway IP address listed above (example: 172.31.255.7). For more information on how to change your computer’s IP settings, consult the Operating System’s “Help” files.
   d. Temporarily disable the wireless adapter(s) on the computer, as these may prevent accessing the HTML Interface pages.

   a. When prompted, enter the User Name: “service”
   b. Enter the unique password that was provided with the Gateway hardware and press ENTER.
   c. This opens the Gateway home page (Figure 70 on page 30).

4. If the M2M Gateway will be using DHCP, skip to step 6. If the M2M Gateway will be using a Static IP address, go to step 5.

5. Click the ‘Network’ tab
   a. Under wlan0 Configuration (Figure 71), select ‘Static IP’ for Connection Type
   b. Enter the IP, Subnet, and Gateway address information
   c. Under wlan0 DNS Servers enter the primary DNS server and click ‘Add’
   d. If a secondary DNS server address is to be entered, enter it after the page has reloaded and click ‘Add’ and enter the secondary address or set ESSID Broadcast to ON.
   e. Click ‘Save’.

6. Click the ‘Wireless’ tab (Figure 72)
   a. Set ESSID broadcast to ON
   b. Enter the ESSID of the network
   c. If Wi-Fi security is enabled enter in Wi-Fi network SSID and password and security type

7. Click the ‘Save Changes’ button in the lower right corner of the page.

8. Click the System tab, then click the Reboot tab.
   a. Click the ‘Yes, really reboot now’ button
   b. The gateway will automatically refresh after several minutes.

9. Click the ‘Status’ tab
   a. Under ‘WLAN’, verify Wi-Fi signal strength (Figure 73).

10. Adjust antenna as necessary to establish a strong Wi-Fi connection
    a. For reliable operation, signal level should be 60 dBm or lower and link quality power should be 50/70 or higher.
    b. As the antenna is adjusted, be mindful that signal strength is impacted by structures or other antennas. As much as practically possible, make efforts to avoid such interference while adjusting the antenna.

11. Once a strong Wi-Fi connection is obtained, close the web browser, and disconnect the laptop and Ethernet cable from the M2M Gateway.

12. Reconnect the Ethernet cable between the M2M Gateway and the MicroTech III controller.

13. Feed excess antenna cable into the control enclosure, then tighten waterproof grommet.

14. Add a bead of silicone around the perimeter of the waterproof grommet penetration into the control enclosure.

15. On inside of enclosure, secure excess antenna cable using zip ties.
**Figure 70: M2M Gateway Home Page**

<table>
<thead>
<tr>
<th>System Information</th>
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<tr>
<td><strong>Firmware</strong></td>
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<td><strong>Kernel</strong></td>
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<td><strong>MAC</strong></td>
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<td><strong>Device</strong></td>
</tr>
<tr>
<td><strong>Username</strong></td>
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<tr>
<td><strong>Web mgt. console</strong></td>
</tr>
<tr>
<td><strong>Version</strong></td>
</tr>
</tbody>
</table>

**Figure 71: Wireless LAN Configuration**

- **lan Configuration**
  - Connection Type: DHCP
  - Interface: eth0

- **wlan0 Configuration**
  - Connection Type: Static IP
  - Interface: wlan0
  - Type: None
  - IP Address
  - Netmask
  - Default Gateway

- **wlan0 DNS Servers**
  - Add

- **wwwan Configuration**
  - Connection Type: WWAN
  - Interface: 3g-wwan
  - /dev/ttyACM0
Figure 72: Wireless Configuration Screen

WIND RIVER
Intelligent Device Platform

<table>
<thead>
<tr>
<th>Networks</th>
<th>Wireless</th>
<th>Multi-WAN</th>
</tr>
</thead>
</table>

**Wireless Configuration**

**Wireless Adapter wlan0 Configuration**

- **Radio**: On

**Wireless Virtual Adapter Configuration for Wireless Card wlan0**

<table>
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<tr>
<th>Network</th>
<th>ESSID Broadcast</th>
<th>RTS (Default off)</th>
<th>Fragmentation (Default off)</th>
<th>ESSID</th>
<th>Encryption Type</th>
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</thead>
<tbody>
<tr>
<td>wlan0</td>
<td>Client</td>
<td>On</td>
<td>On</td>
<td>Your ESSID</td>
<td>wpa-psk</td>
</tr>
</tbody>
</table>

**Network:**
- The network field is set to READY to set the wireless card to a different network, modify it on networks page.

**Mode:**
- When switching to a different mode, you may need to adjust the firewall forwarding rules, drop list rules, MAC filter settings on firewall, DHCP settings page.

**ESSID:**
- When switching to Access Point mode, set the ESSID field to a unique string or change it from Client mode, set the ESSID field to the remote Access Point, when switching to Ad-hoc mode, set the ESSID field to the other network you want to join.

**Encryption Type:**
- WPA-PSK should be alphanumeric and should not end with 0 and it should be either 10 or 20 characters or you can type something in WEP PASS and generate it through GS.
- wpa-psk or wpa-psk key should be from 8 to 63 printable ASCII characters or 64 hexadecimal digits.

---

Figure 73: Wireless Signal Strength

**WLAN0**

- **IP Address**: 10.150.1.53
- **MAC Address**: e0:9d:31:31:2a:d0
- **IPv6 Address (Link)**: fe80::e29d:31ff:fe31:2ad0/64
- **Received**: 470 pkts (32.3 KIB)
- **Transmitted**: 246 pkts (31.7 KIB)
- **MTU**: 1500

**WLAN**

- **ESSID**: Corp
- **Mode**: Managed
- **Frequency**: 2.437 GHz
- **Access Point**: 00:3a:99:33:87:31
- **Bit Rate**: 18 Mbps
- **Transmit Power**: 15 dBm
- **Retry**: 7
- **RTS**: off
- **Fragmentation**: off
- **Encryption Key**: wpa-psk

- **Power Management**: on
- **Link Quality**: 56/70
- **Signal Level**: -54 dBm

---

**Raw Information**

[Show raw statistics]

---

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[About Weibi]

[Apply Changes « Clear Changes « Review Changes «]
**Configuration for Hard-Wired Connection**

The M2M Gateway is configured using a set of HTML interface pages within the Wind River Intelligent Device Platform. The table below identifies the Wind River configuration parameters, along with the corresponding physical port on the M2M Gateway. For reference, it also includes the corresponding device connection to the M2M Gateway.

<table>
<thead>
<tr>
<th>Wind River configuration parameter</th>
<th>M2M Gateway port</th>
<th>Device Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN</td>
<td>ETH (which is eth0)</td>
<td>MTIII Unit Controller</td>
</tr>
<tr>
<td>wan</td>
<td>USB2 (which is eth1)</td>
<td>Local Network</td>
</tr>
<tr>
<td>wlan0</td>
<td>WLAN</td>
<td>WiFi</td>
</tr>
<tr>
<td>wwan</td>
<td>3G/GPRS</td>
<td>Cellular</td>
</tr>
</tbody>
</table>

The following procedures should be used to configure the Intelligent Equipment solution for hard-wired Local Area Network (LAN) connectivity (note: it is the “wan” interface in the gateway that will be configured):

1. Remove the USB-to-Ethernet converter from the envelope and connect it to an open USB port on the M2M Gateway (this is necessary because the M2M Gateway has a single Ethernet plug, which is connected to the MicroTech III controller, and, therefore, unavailable for the purpose of connecting to the local network).
   a. Connect the provided Ethernet patch cable to the USB-to-Ethernet adapter and to the local network (DHCP is enabled by default).

2. Using a laptop computer and Ethernet cable, connect to the “ETH” port of the M2M Gateway (you will need to temporarily disconnect the Ethernet cable between the M2M Gateway and the MicroTech III controller, to make use of the “ETH” port on the M2M Gateway).
   a. Connect the MAC address to the ethernet adapter and to the network (DHCP is enabled by default).
   b. In order to access these pages, your computer must be on the same subnet as the M2M Gateway, which is shipped set to a default IP subnet mask (255.255.0.0) and IP address (https://172.31.255.1). You must change the computer’s network settings to match the subnet.
   c. Navigate to your laptop’s Local Area Connection settings screen and change the IP subnet mask to 255.255.0.0, and the IP address to be compatible with the default M2M Gateway IP address listed above (example: 172.31.255.7). For more information on how to change your computer’s IP settings, consult your PC operating system’s “Help” files.
   d. Temporarily disable the wireless adapter(s) on the computer, as these may prevent accessing the HTML Interface pages.

3. Open a web browser and type, https://172.31.255.1, then press enter.
   a. When prompted, enter the User Name: “service”.
   b. Enter the unique password that was provided with the Gateway hardware and press ENTER.
   c. This opens the Wind River Intelligent Device Platform configuration page in the gateway (Figure 74 on page 33).

**NOTE:** If you will use DHCP for your local network configuration, please proceed to step 8.

4. Click the ‘Network’ tab

5. Locate the ‘wan Configuration’ section (Figure 75 on page 34)
   a. Under wan Configuration select ‘Static IP’ for Connection Type
   b. Ensure that Interface = eth1
   c. Enter the IP, Subnet, and Gateway address information
   d. Under wan DNS Servers enter your network’s primary DNS server and click ‘Add’ (NOTE: If you prefer to use a public DNS server, use 8.8.8.8 or 4.2.2.2)
   e. If a secondary DNS server address is to be entered, enter it after the page has reloaded and click ‘Add’ and enter the secondary address.

6. Click the ‘Save Changes’ button in the lower right corner of the page.
   a. IMPORTANT: Allow the page to refresh
   b. Confirm that there is number in parentheses next to “Review Changes”. If so, proceed to step 7; if not, repeat steps 5 and 6.

7. Click the ‘Apply Changes’ button in the lower right-hand corner of the screen. The page will automatically refresh when complete (this can take as much as two minutes).

8. Click the ‘Multiwan’ tab
   a. Scroll to the bottom of the page and Click ‘Add New Interface’ (Figure 76 on page 34)
   b. Name the interface, “wan” (must match the name of the interface configured in step 5.
   c. Click ‘Add new interface’

9. Once created, set “ICMP hosts” of new interface to “disable”

10. Under ‘Priority Interface’, set to “wan”
11. Click ‘Save changes’ button
   a. IMPORTANT: Allow the page to refresh
   b. Confirm that there is number in parentheses next to “Review Changes”. If so, proceed to step 12; if not, repeat steps 8-11.

12. Remove ‘wwan’ interface
13. Remove ‘wlan0’ interface
14. Click the ‘Save Changes’ button
   a. IMPORTANT: Allow the page to refresh
   b. Confirm that there is number in parentheses next to “Review Changes”. If so, proceed to step 15; if not, repeat steps 8-14.

15. Click the ‘Apply Changes’ button in the lower right-hand corner of the screen. The page will automatically refresh when complete (this can take as much as two minutes).

16. Confirm that ‘ICMP host’ of “wan” interface is still set to “disable”
   a. If so, go to step 17.
   b. If not, set to “disable”
   c. Click ‘Save changes’ button
      i. IMPORTANT: Allow the page to refresh
      ii. Confirm that there is number in parentheses next to “Review Changes”. If so, proceed to step 16; if not, repeat steps 8-16.

17. Click the ‘System’ tab, then click the Reboot button.

NOTE: Be certain that the IT staff has allowed incoming and outgoing internet traffic on TCP ports 80, 443, 3197, 3199, 5222, 5223 and 8080.

Figure 74: M2M Gateway Home Page
### Figure 75: WAN Configuration Settings

**WIND RIVER**

*Intelligent Device Platform 2.0*

#### Network Configuration

<table>
<thead>
<tr>
<th>Connection Type</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static IP</td>
<td>with DHCP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IP Address</th>
<th>Subnet Mask</th>
<th>Default Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>192.168.1.41</td>
<td>255.255.255.0</td>
<td>192.168.1.1</td>
</tr>
</tbody>
</table>

**Connection Type:**
- Static IP: The network interface will be disabled. Static IP address of the interface is statically set. DHCP: The interface will obtain its IP address from a DHCP server. IP address is randomly assigned to each connection.

**Interface:**
- Virtual interface used by this network can have multiple interfaces separated by spaces with bridged type. For example, valid interface names are eth0, eth0:100, wlan0, wlan0:2, etc.

**IP Settings:**
- IP settings are optional for DHCP. They are used as defaults in case the DHCP server is unavailable.

### Figure 76: ‘Add New Interface’ Selection

**Add New Interface to Monitor**

<table>
<thead>
<tr>
<th>New Interface Name</th>
<th>Add New Interface</th>
</tr>
</thead>
</table>

**New Interface Name:** The new interface you want to monitor.

---

About Intelligent Device Platform  
About Website

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Verify Time Zone Information

The M2M Gateway comes pre-configured from the factory with the Time and Time Zone set based on the location of the installation site. However, during troubleshooting, the installer may need to confirm that the factory setting is accurate, and ensure that the correct information is also set in the MicroTech III unit controller.

1. Using a laptop computer and Ethernet cable, connect to the “ETH” port of the M2M Gateway (you will need to temporarily disconnect the Ethernet cable between the M2M Gateway and the MicroTech III controller, to make use of the “ETH” port on the M2M Gateway).
   a. The Cellular strength of the M2M Gateway is verified using an HTML Interface page in an HTTP server.
   b. In order to access this page, your computer must be on the same subnet as the M2M Gateway, which is shipped set to a default IP subnet mask (255.255.0.0) and IP address (https://172.31.255.1). You must change the computer’s network settings to match the subnet (the signal strength verification process is the same regardless of the operating system on your computer).
   c. Navigate to your laptop’s Local Area Connection settings screen and change the IP subnet mask to 255.255.0.0, and the IP address to be compatible with the default M2M Gateway IP address listed above (example: 172.31.255.7). For more information on how to change your computer’s IP settings, consult the Operating System’s “Help” files.
   d. Temporarily disable the wireless adapter(s) on the computer, as these may prevent accessing the HTML Interface page.
2. Open a web browser page and type, https://172.31.255.1, then press enter.
   a. When prompted, enter the User Name: “service”
   b. Enter the unique password that was provided with the Gateway hardware and press ENTER.
   c. This opens the Gateway home page.
3. Click the ‘System’ tab (Figure 77 on page 36).
   a. Select the ‘Settings’ tab
   b. Under ‘Time Zone’, verify that the indicated Time Zone is accurate. If so, continue to step 5.
4. If the Time Zone is inaccurate, use the list to select the correct Time Zone, then click, ‘Save Changes’.
   a. After saving changes, the screen will refresh.
5. Click, ‘Apply Changes’ to write the change to the Gateway’s configuration file.
   a. After applying changes, the screen will briefly indicate that the configuration is being updated, then will refresh to display the new time zone.
6. You will notice that the time in the upper right corner of the webpage will now reflect accurately based on the selected Time Zone (Figure 78).
7. Once the Time Zone is verified in the M2M Gateway, you will verify the time in the MicroTech III unit controller. Begin by entering the password of 6363. Next, from the main menu of the unit controller (Figure 79), turn the knob clockwise until ‘View/Set Unit’ is highlighted, then depress the knob to enter the ‘View/Set Unit’ menu.
   a. Press in on the knob to enter the ‘View/Set Unit’ menu
8. From the ‘View/Set Unit’ menu, turn the knob clockwise until ‘Date/Time/Schedules’ is highlighted. Depress the knob to enter the ‘Date/Time/Schedules’ menu. Verify that the ‘Time’, ‘Date’, and ‘UTC Diff’ (Figure 79) are all correct. If any require a change, simply use the knob to highlight that field, then press in on the knob to select, which makes the item adjustable. Use the knob to increase/decrease the value, then press in on the knob to enter
9. Once the ‘Time’, ‘Date’, and ‘UTC Diff’ are all correct, press the BACK button to return to the main menu.

NOTE: For more information on navigating the MicroTech III rooftop unit controller keypad display, please see the appropriate operation manual for the unit model.
Figure 77: System Tab

**WIND RIVER**

**Intelligent Device Platform 2.0**

<table>
<thead>
<tr>
<th>Info</th>
<th>Graphs</th>
<th>Status</th>
<th>Log</th>
<th>System</th>
<th>Network</th>
<th>Device Agent</th>
<th>Logout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Control</td>
<td>Password</td>
<td>Settings</td>
<td>Startup</td>
<td>Crontabs</td>
<td>File Editor</td>
<td>Mountpoints</td>
<td>TPM</td>
</tr>
</tbody>
</table>

**System Settings**

- **Host Name**: Daikin_IE_1.2

**Time Settings**

- **Timezone**: CST/CDT
- **POSIX TZ String**: /etc/zoneinfo/CST/CDT
- **NTP Server**:
  - Host: pool.ntp.org
  - Port: 123

**Webif® Settings**

- **Language**: English
- **Theme**: WindRiver

Apply Changes « Clear Changes « Review Changes « Save Changes

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Figure 78: Time Updated to Time Zone

Wind River Intelligent Device Platform 2.0
Host: Daikin_IE_1.2
Date: 2019-04-09
Uptime: 4 days, 22:12, 0 users
Time: 14:34:25
Load: 0.74, 3.22, 2.92

Figure 79: Keypad Controls

Figure 80: Date/Time/Schedules Menu
Potential issues:

**Gateway does not power up (LED does not illuminate)**
- Verify 120V at TB1
- Verify that power supply wires are properly installed in terminals TB1-11B and TB1-32B (AGZD/E) or MQ-11 and MQ-17 (AWV or AWS)
- Verify that power supply is properly connected to the Gateway
- Contact Daikin Applied

**Energy Management Module does not power up**
- Verify USB cable connection to Gateway and Energy Management Module
- Verify that Gateway has power
- Contact Daikin Applied

**Cell connection cannot be established**
- Check antenna connection to magnetic base
- Check antenna connection to 3G/GPRS connection on Gateway
- Confirm SIM card is fully seated in the gateway; this may require ejecting, then re-inserting the SIM card. See Figure 81 for SIM card location.
- Check signal strength through WebIF
- Verify APN settings
- Verify that neither a LAN or Wi-Fi connection has been established
- Contact Daikin Applied

**Wi-Fi connection cannot be established**
- Check antenna connection to magnetic base
- Check antenna connection to WLAN connection on Gateway
- Check signal strength through WebIF
- Verify Wi-Fi IP addressing, ESSID, and login credentials match customer supplied Wireless LAN requirements
- Connect to Wi-Fi network and try to ping the Gateway’s WLAN IP address
- Verify that neither a LAN or Cell connection has been established
- Contact Daikin Applied

**LAN connection cannot be established**
- Confirm proper installation of USB to Ethernet adapter
- Verify LED activity on USB to Ethernet adapter
- Verify LAN addressing through Web IP
- Connect to LAN and try to ping the Gateway’s LAN IP address
- Verify that neither a Wi-Fi or Cell connection has been established
- Contact Daikin Applied

**MicroTech III Data Not Showing Up In User Interface**
- Confirm Ethernet cable is plugged into ‘ETH’ port on Gateway
- Confirm Ethernet cable is plugged into ‘TIP’ port on MicroTech III controller
- Check for LED activity on Gateway’s ETH port
- Verify IP address of Eth0 on the Gateway is 192.168.1.40
- Verify IP address of the MicroTech III controller is 192.168.1.42
- Contact Daikin Applied
Appendix A

Wi-Fi or Hardwired LAN Ethernet connection Pre-Start-up Form

The Intelligent Equipment gateway is capable of communicating via cellular connection, Wi-Fi Ethernet connection, or hardwired LAN Ethernet connection. For either Ethernet connection the gateway supports DHCP to have an IP address assigned automatically, or it can be field programmed with a static IP address.

If an Ethernet connection is to be used for either type, the customer’s LAN Administrator should review and supply the following information (as necessary) prior to going to the jobsite and commissioning the gateway.

1. IT Group must allow incoming and outgoing internet traffic on TCP ports 80, 443, 3197, 3199, 5222, 5223 and 8080 for hardwired LAN connections.

2. If the gateway will be required to use a static IP address the following information will need to be supplied:

<table>
<thead>
<tr>
<th>Information</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal LAN Static IP Address</td>
<td></td>
</tr>
<tr>
<td>IP Subnet Mask</td>
<td></td>
</tr>
<tr>
<td>Default Gateway</td>
<td></td>
</tr>
<tr>
<td>DNS Server (primary)</td>
<td></td>
</tr>
<tr>
<td>DNS Server (secondary)</td>
<td></td>
</tr>
<tr>
<td>Proxy Server IP Address</td>
<td></td>
</tr>
<tr>
<td>Proxy Server Port Number</td>
<td></td>
</tr>
</tbody>
</table>

3. For Wi-Fi Ethernet connections the following information will be required as well:

<table>
<thead>
<tr>
<th>Information</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wi-Fi network SSID</td>
<td></td>
</tr>
<tr>
<td>Wi-Fi network password</td>
<td></td>
</tr>
<tr>
<td>Wi-Fi encryption type</td>
<td></td>
</tr>
<tr>
<td>Wi-Fi Mode</td>
<td></td>
</tr>
<tr>
<td>Preferred Wi-Fi channel</td>
<td></td>
</tr>
</tbody>
</table>
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Now that you have made an investment in modern, efficient Daikin equipment, its care should be a high priority. For training information on all Daikin HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

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