



## MICROTECH® III WATER SOURCE HEAT PUMP UNIT CONTROLLER

MTIII WSHP SOFTWARE DOWNLOAD AND CONFIGURATION

- WSHP UNIT CONTROLLER
- I/O EXPANSION MODULE
- BACNET<sup>®</sup> AND LONWORKS<sup>®</sup> COMMUNICATION MODULE



- MODELS: GSH/GSV, GTH/GTV, GCV SMARTSOURCE® SINGLE AND TWO STAGE COMPRESSOR
- CCH/CCW, LVC/LVW, MHC/MHW, VFC/VFW, VHC/ VHF ENFINITY<sup>®</sup> SINGLE STAGE COMPRESSOR
- CCH/CCW AND LVC/LVW ENFINITY<sup>®</sup> LARGE TWO COMPRESSOR





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### **General Information**

### Description

This manual describes how to download and configure the MicroTech<sup>®</sup> III water source heat pump (WSHP) unit controller, I/O expansion module, and network communication software. It also explains what programming tools are needed to install and verify that the correct software has been installed correctly.

It is assumed that the unit controller and optional modules have been installed and are functioning properly. If necessary, refer to the Reference Documents section for installation manual details.

This guide is organized into four main sections:

- 1. WSHP Unit Controller and I/O Expansion Module
- 2. BACnet Communication Module
- 3. LONWORKS Communication Module
- 4. Troubleshooting Guide and FAQ
- 5. Appendix: Legacy Programmers

### **Hazardous Information Messages**

#### DANGER

Danger indicates a hazardous situation, which will result in death or serious injury if not avoided.

#### 

Warning indicates a potentially hazardous situations, which can result in property damage, personal injury, or death if not avoided.

#### 

Caution indicates a potentially hazardous situations, which can result in minor injury or equipment damage if not avoided.

#### NOTICE

Notice indicates practices not related to physical injury.

**NOTE:** Indicates important details or clarifying statements for information presented.

### **Reference Documents**

Number	Company	Title	Source
<u>OM 931</u>		MicroTech III Water Source Heat Pump Enfinity Single Stage Compressor Unit Controller Operation and Maintenance Manual	
<u>OM 1149</u>		MicroTech III Water Source Heat Pump SmartSource Single & Two Stage Compressor (Series2) Unit Controller Operation and Maintenance Manual	
<u>OM 1239</u>	Daikin Ap- plied	MicroTech III Water Source Heat Pump Enfinity Large Two Compressor (SS2C) Unit Controller Operation and Maintenance Manual	<u>www.DaikinAp-</u> plied.com
<u>OM 1</u> 254		Daikin Applied System Man- ager Operation Manual	
<u>IM 927</u>		MicroTech III Water Source Heat Pump LonWORKS Communication Module Installation Manual	
<u>IM 928</u>	1	MicroTech III Water Source Heat Pump BACnet Com- munication Module Installa- tion Manual	1
ED 15103		MicroTech III Water Source Heat Pump Unit Controller	

### Terminology

- **MicroTech III Unit Controller:** The baseboard attached to the WHSP which is downloaded with the most current version of application software for unit operation. The terms **MicroTech III or MTIII** are also used to reference the I/O expansion module and communication modules in addition to the baseboard.
- **I/O Expansion Module:** Optional daughter board that provides additional input/output capability for secondary compressor, multiple speed fan, secondary heating, and dehumidification control. The I/O expansion module is attached directly to unit controller when these options have been selected with the unit.
- Custom Interface Cables: Two different cable kit assemblies have been designed by Daikin for use with the programming tools needed to download software to the baseboard part number 668105611 or I/O expansion module part number 668105711. One cable assembly supports the Renesas E2 Lite/E1 programmer. A separate (but similar) cable assembly supports the Renesas E8a programmer. Each custom cable assembly includes a small PCB with 14-pin port for connection to the Renesas programmer and either a 6-pin or 10-pin port (depending on WSHP controller hardware version) for connection to the baseboard or I/O expansion module.
- JTAG: The hardware interface required for downloading older versions of unit controller and I/O expansion module software. JTAG refers to both the connector port attached to the unit controller as well as the cable used to download software to the BACnet communication module.

- Renesas Flash Programmer (RFP) Tools: The software used with the Renesas E2-Lite or E1 hardware. The RFP is used to program the R5F101FE MCU on WSHPs with hardware PNs 668105611 and 668105711.
- .**rpj File:** The project file type used used to specify the RFP software configuration settings.
- Renesas Flash Development Toolkit (FDT): The software used with the Renesas E8a hardware to program the obsolete 740 family of Renesas microcontrollers. The FDT supports the M38507F8A MCU used on WSHPs with hardware PNs 668105601 and 668105702.
- Segger Flasher Tools (Obsolete): The software used with the Segger Flasher5 hardware to program the 740 family of legacy Renesas microcontrollers. Flasher5 supports the M38507F8A MCU used on WSHPs with hardware PNs 668105601 and 668105702.
- Segger J-Link / Atmel SAMBA Tools: The software used with the Segger J-Link / Atmel SAM-ICE hardware to program the BACnet communication module microcontroller used on FCU/WSHP hardware PN 668105901.
- .hex File: The unit controller baseboard or I/O expansion module software file. A separate .hex file is required for each board.
- .mot File: The unit controller baseboard or I/O expansion module software file. A separate .mot file is required for each board.
- .bin File: The BACnet communication module firmware.
- .nxe File: The LONWORKS communication module firmware.
- **U-10:** The network inteface hardware used for LONWORKS communication module software downloading.
- MCU: Refers to the microcontroller unit chip. It uses embedded Flash memory to store and execute the application.

### **Getting Started**

This section describes the hardware and software tools needed to download and configure a MicroTech III WSHP unit controller. These instructions are based on downloading the latest version of SmartSource<sup>®</sup> WSHP code. The same tools and set-up procedures apply to Enfinity<sup>®</sup> and Enfinity Large Two-Compressor WSHPs; the only difference is the software application file. Refer to Table 1 for hardware and software part numbers and Table 2 for specifications.

NOTE: The controls hardware/software part numbers are described as "Legacy" for the older versions and "Current" for the latest (and final) MicroTech III software version.

#### Table 1: MicroTech III WSHP Part Numbers

	Unit Controller (Baseboard)	IO Expansion Board
Current Unit Controls		
Hardware	668105611	668105711
Software		
Enfinity	2508085–01–1	2508086-01-0
SmartSource	2508078-01-1	2508079–07–0
Enfinity Large Two-Com- pressor	2508088–01–1	2508089–01–0
Legacy Unit Controls		
Hardware	668105601	668105702
Software		
Enfinity	2506900–03–2	2506901–03–0
SmartSource	2508060-06-2	2508061-06-2
Enfinity Large Two-Com- pressor	2508069-01-1	2508070-01-0

#### Table 2: Specifications

MT III WSHP (Current) PN: 668105611	MT III WSHP (Legacy) PN: 668105601
Renesas Programmer Device	
Renesas RL78/G13 Family MCU	Renesas 740 Family MCU
Model R5F101FE with 64KB Flash, 4KB RAM	Model M38507F8A with 32KB Flash, 1KB RAM
Use Renesas E2 Lite or E1 (discon- tinued) programmer and USB sup- plied with kit. USB driver requires the Renesas Flash Programmer (RFP) software as described in Table 7	Use Renesas E8a programmer and USB supplied with kit. USB driver requires the Flash Development Toolkit Basic software as described in Table 7
Interface Cable	
Programming requires an additional interface cable as shown in	Programming requires an additional interface cable as shown in Figure 9
Interface cable is custom supplied by board manufacturer	Contact the ATS Technical Response Team at 315-282-6434 to acquire additional interface cable
Power	
Unit controller baseboard: 24 VAC	
General Notes	
CN_PGRM port located on base- board and I/O expansion board is used only for programming	JTAG port on baseboard and I/O expansion board is used only for
SERVICE port on baseboard and I/O expansion board is used only for serial port diagnostics	programming and service serial port diagnostics
Program/Run jumper not used	Program/Run jumper is used

## MicroTech III WSHP Software Compatibility

There are four WSHP unit models supported by MicroTech III controls. The software application is specific to the unit model. See Table 3 - Table 6 for compatibility among the unit models, hardware part numbers, and software versions. Figure 1 (Enfinity) and Figure 2 (SmartSource) show the software label as it is applied on two different vintages of the unit controller. This label indicates the version of factory-installed code.

	WSHP Unit Controller Models MHC/MHW, CCH/CCW (5-Ton or Less), VFC/VFW, VHC/VHFW										
			Baseboard - Current Software: 2508085 Hardware: 668105611				Baseboa Software Hardware	rd - Legacy e: 2506900 : 66810560	/	-	-
Auxiliary Board	Part Number	Version	v1.1	v2.5	v2.6	v2.7	v2.8	v2.9	v3.0	v3.1	v3.2
	Legacy	v2.4	No	Yes	No	No	No	No	No	No	No
		v2.6	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
I/O Expan-	Hardware: 668105702	v2.8	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
sion Module		v3.0	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Current Software: 2508086 Hardware: 668105711	v1.0	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Software: 2506903	v2.51	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
		v2.71	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
		v2.81	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
BACnet		v3.01	Yes <sup>4</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
Module	Hardware: 668105901	v3.1 <sup>1</sup>	Yes	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes	Yes	Yes
		v3.21	Yes	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes	Yes	Yes
		v3.31	Yes	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes	Yes	Yes
		v3.4	Yes	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes	Yes	Yes
		v2.5 <sup>2</sup>	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
	Softwares 250000	v2.7 <sup>2</sup>	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
Module	Hardware: 668105801	v2.8 <sup>2</sup>	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
		v3.0 <sup>2</sup>	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>4</sup>	Yes <sup>4</sup>
		v3.1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#### Table 3: Software Compatibility – Enfinity Single Speed Compressor Models

1. BACnet software v3.4 or greater is recommended for optimal network communications performance.

2. LONWORKS software v3.1 or greater is recommended for optimal network communications performance.

3. WSHP unit controller and BACnet software versions are fully compatible. Note that the heat pump number (HP), which is visible at the top of the BACnet Configuration Menu, from the BAS, or other BACnet application, may appear as an invalid number between 0 and 255 when the BACnet software version is newer than the unit controller software version. Although visible, the HP number shown does not impact the unit or network communication performance. 4. Low Entering Water Temperature (EWT) alarm is not supported by the communication module.

#### Table 4: Software Compatibility – SmartSource Single and Two Speed Compressor (Series2) Models

WSHP Unit Controller Models GSH/GSV, GTH/GTV, GCV, GCH, Enfinity CCH/CCW (5-Ton or Less), VFC/VFW, MHC/MHW									
			Baseboard - Current Software: 2508078 Hardware: 668105611		Baseboard Software: Hardware:	l - Legacy 2508060 668105601			
Auxiliary Board	Part Number	Version	v1.1	v5.0	v6.0	v6.1	v6.2		
		v5.0	Yes <sup>2,3</sup>	Yes	Yes <sup>2</sup>	Yes <sup>2</sup>	Yes <sup>2,3</sup>		
	Legacy Software: 2508061	v6.0	Yes <sup>3</sup>	Yes	Yes	Yes	Yes <sup>3</sup>		
	Hardware: 668105702	v6.1	Yes <sup>3</sup>	Yes	Yes	Yes	Yes <sup>3</sup>		
I/O Expansion Module		v6.2	Yes	Yes	Yes	Yes	Yes		
	Current	v1.0 <sup>5</sup>	Yes	Yes	Yes	Yes	Yes		
	Software: 2508079 Hardware: 668105711	v7.0	Yes	Yes	Yes	Yes	Yes		
		v5.01	Yes	Yes	Yes	Yes	Yes		
		v6.01	Yes	Yes	Yes	Yes	Yes		
BACnot Modulo	Software: 2508062	v6.11	Yes	Yes	Yes	Yes	Yes		
BAGnet Module	Hardware: 668105901	v6.21	Yes	Yes	Yes	Yes	Yes		
		v6.31	Yes	Yes	Yes	Yes	Yes		
		v6.4	Yes	Yes	Yes	Yes	Yes		
	Software: 2508063	v5.04	Yes	Yes	Yes	Yes	Yes		
LONWORKS Module	Hardware: 668105801	v6.0	Yes	Yes	Yes	Yes	Yes		

1. BACnet software v6.4 or greater is recommended for optimal network communication performance.

The I/O expansion module does not support Hydronic Heating.
 The I/O expansion module does not support Hydronic Cooling (WSE).
 LonWorks v6.0 or greater is recommended for optimal network communication performance.
 Hydronic Heating/Cooling not supported by the I/O expansion module.

#### Table 5: Software Compatibility – Enfinity Large Two Compressor (SS2C) Models

	WSHP Unit Controller Models CCH/CCW (6-Ton or Greater), LVC/LVW									
			Baseboard - Current Software: 2508088 Hardware: 668105611	F	Baseboard - Legacy Software: 2508069 lardware: 668105601					
Auxiliary Board	Part Number	Version	v1.1	v1.0	v1.1	v1.2				
VO Francisco Madula	Legacy Software: 2508070 Hardware: 668105702	v1.0	Yes	Yes	Yes	Yes				
	Current Software: 2508089 Hardware: 668105711	v1.0	Yes	Yes	Yes	Yes				
		v1.01	Yes	Yes	Yes	Yes				
DACnot Madula	Software: 2508071	v1.1 <sup>1</sup>	Yes	Yes	Yes	Yes				
BAChet Module	Hardware: 668105901	v1.21	Yes	Yes	Yes	Yes				
		v1.3	Yes	Yes	Yes	Yes				
	Software: 2508072	v1.0 <sup>2</sup>	Yes	Yes	Yes	Yes				
LONWORKS MOUUIE	Hardware: 668105801	v1.1	Yes	Yes	Yes	Yes				

1. BACnet software v1.3 or greater is recommended for optimal network communications performance. 2. LONWORKS software v1.1 or greater is recommended for optimal network communications performance.

#### Table 6: Software Compatibility – Enfinity Two Speed Compressor, Multi-Fan Speed (Series1) Models

	WSHP Unit Controller Models C2H/C2W								
				Baseboard - Lo Software: 250 Hardware: 6681	egacy 8051 105601				
Auxiliary Board	Part Number	Version	v1.0	v1.1	v1.2	v1.3			
I/O Expansion Module	Legacy	v1.0	Yes	Yes	Yes	Yes			
	Software: 2508052 Hardware: 668105702	v1.1	Yes	Yes	Yes	Yes			
PACnot Modulo	Software: 2508053	v1.0	Yes	Yes	Yes	Yes			
BACHEL MOUULE	Hardware: 668105901	v1.1	Yes	Yes	Yes	Yes			
	Software: 2508054	v1.0	Yes	Yes	Yes	Yes			
LONWORKS WOULIE	Hardware: 668105801	v1.1	Yes	Yes	Yes	Yes			

Figure 1: Legacy WSHP Unit Controller Software Revision Label (Enfinity)



Unit controller software version label. Note this is shown for reference only, and may not reflect the most current version of code.

Figure 2: Current WSHP Unit Controller Software Revision Label (SmartSource)



Unit controller software version label. Note this is shown for reference only, and may not reflect the most current version of code.

#### Figure 3: BACnet and LonWorks Communication Module Software Version Labels





#### Table 7: MicroTech III WSHP – Overview of Programming Tools

MicroTech III WSHP Programming Tool	Is for Current and Legacy Unit Controls
Unit Controller Hardware (Current): 668105611 I/O Expansion Board Hardware (Current): 668105711	Unit Controller Hardware (Legacy): 668105601 I/O Expansion Board Hardware (Legacy): 668105702
Hardware	
Renesas E2 Lite or E1 programmer available at <u>www.renesas.com/us/en/prod-ucts/software-tools/tools/emulator/e2-emulator-lite.html</u>	Renesas E8a programmer, available a <u>t www.renesas.com/us/en/products/</u> software-tools/tools/emulator/e8a.html The original Segger Flasher5 programmer can also be used to program legacy boards. However, it is no longer available from the supplier for purchase. Instruc- tions are provided in previous versions of OM 1085
New (2024) custom 6-pin interface cable (Figure 6) that connects the unit con- troller to the Renesas programmer cable. <i>This cable is not included in Renesas</i> <i>E2 Lite or E1 programmer kit when ordered from Renesas</i> . Contact the ATS Technical Response Team at 315-282-6434 to request this cable. Reference PN 250808701	Legacy custom 10-pin interface cable that connects the unit controller JTAG port to Renesas E8a programmer. <i>This cable is not included in Renesas E8a pro- grammer kit when ordered from Renesas</i> . Contact the ATS Technical Response Team at 315-282-6434 to request this cable
Software	
Renesas Flash Program (RFP) software available at www.renesas.com/us/en/software/D3017334.html	Renesas Flash Development Toolkit software available at www.renesas.com/us/en/products/software-tools/tools/programmer/flash-devel- opment-toolkit-programming-gui.html
Unit controller software, which is a ".hex" file type and needs to be saved to your hard drive. Contact the ATS Technical Response Team at 315-282-6434 to request a copy of this file	Unit controller software, which is a ".mot" file type and needs to be saved to your hard drive. Contact the ATS Technical Response Team at 315-282-6434 to request a copy of this file
No Program/Run jumper is used	Program/Run jumper is used
BACnet Communication Module (Applies to all MicroTech III WSHP Unit Com	trollers)
Hardware	
BACnet communication module installed on the WSHP baseboard	
1. Segger J-Link programmer, available at <u>www.segger.com</u> or	
2. ATMEL SAM-ICE programmer, available at <u>www.DigiKey.com</u> . Reference AT91	SAM-ICE-ND or equivalent
Software	
Segger J-Link software and documentation pack for Windows available at www.se	egger.com/downloads/jlink/#J-LinkSoftwareAndDocumentationPack
SAM-BA v2.18 software free download available at www.microchip.com/Developm	nentTools/ProductDetails/PartNO/SAM-BA%20In-system%20Programmer
BACnet .bin file is available by contacting the Controls Customer Support group a	t 866-462-7829
LONWORKS Communication Module (Applies to all MicroTech III WSHP Unit C	Controllers)
Hardware	
LONWORKS communication module installed on the WSHP baseboard	
Twisted pair cable with 3-pin connector: Echelon TP/FT-10 to USB network interfa	ice, U10 or similar
Software	
XIF/NXE files - <u>www.DaikinApplied.com</u> or <u>www.lonmark.org</u>	
LONWORKS application such as OpenLNS CT, or CT available from Echelon at ww	vw.echelon.com

### Download and Configuration Unit Controller and I/O Expansion Module

The following describes how to download and verify the WSHP unit controller and I/O expansion module software.

There are two sets of unit controller (baseboard) and companion I/O expansion module hardware part numbers.

The software loaded on the boards varies depending on the WSHP model (SmartSource, Enfinity, etc.)

**NOTE:** Before proceeding, refer to Table 3 - Table 6 in order to confirm which version of board(s) you have, and thus which tools to use. Figure 1 and Figure 2 show where to find the sticker labels on each board.

#### Downloading to Baseboard #668105611 or I/O Expansion Module #668105711 with Renesas E2 Lite or E1 Programmer

#### **Getting Started**

You will need the following:

- WSHP unit controller baseboard with hardware part number 668105611 or I/O expansion board with hardware part number 668105711.
  - Renesas E2 Lite or E1 programmer hardware. Note that the ribbon cable is not needed when using the new custom cable described below.
  - New custom interface cable. Contact the ATS Technical Response Team at 315-282-6434 to request this cable. Reference part number 250808701. See Figure 6 and Figure 7.
  - Renesas Flash Programmer (RFP) software. The RFP includes the Renesas Project File (.rpj) used for determining the configuration settings. Specifications and links to the Renesas website are in Table 7 and Note below.
  - Computer with a Windows-compatible operating system. Refer to <u>www.renesas.com</u> for more information.
  - WSHP unit controller and I/O expansion module .hex file. See Note below.
- **NOTE:** Contact the ATS Technical Support Team at 315-282-6434 to request a copy of the .hex and/or .rpj file. These files can also be downloaded from the Daikin Applied website at <u>www.daikinapplied.com/</u>resources/application-software.

#### Installing the Renesas E2 Lite or E1 Programmer

The instructions below apply to downloading the WSHP unit controller or I/O expansion board using the Renesas E2 Lite programmer (Figure 4).

The Renesas E1 programmer can also be used but is no longer supported. The differences are noted where necessary.

- 1. Acquire the Renesas E2 Lite programmer and interface cable as described in Table 7.
- Download the latest Renesas Flash Programmer (RFP) software from the Renesas website at <u>www.renesas.</u> <u>com/us/en/software/D3017334.htm</u>.
- **NOTE:** It is important that you install the Flash Programming software before connecting the programmer to the USB port on your computer. The USB driver is automatically installed.
  - 3. Connect the E2 Lite programmer to the USB port on your computer using the USB interface cable.
    - a. Connect the mini-B plug of the USB interface cable to the USB I/F connector of the E2 Lite.
    - b. Connect the A plug of the USB interface cable to the USB port on your computer.
- **NOTE:** The E2 Lite is active once connected to the USB interface cable.
  - 4. Power down the unit controller.
  - 5. Connect the E2 Lite programmer to the MCU:
    - Insert the 14-pin connector of the new custom interface cable assembly into the user-side connector pins of the E2 Lite programmer (Figure 7).
    - b. Connect the 6-pin connector to the CN\_PGRM port on the control board (Figure 8).
  - 6. Apply power to the unit controller.
- **NOTE:** Do not remove power from the unit controller or unplug the USB interface cable during this process. The power supplied from the board to the programmer could possibly damage the hardware.
  - 7. Open the Renesas Flash Programmer (RFP) software.
  - 8. Click Open Project from the File menu.
  - Browse to the Renesas Programmer Project file (.rpj file type) and click Open. See the Note at the end of the Getting Started section if you do not have this file.
  - Click Browse in the Project File section to select the Baseboard or IO Expansion Board (.hex file type) and click Open. See the Note at the end of the Getting Started section if you do not have this file.
  - If using the E1 programmer, follow steps 11a-b. Otherwise, if using the E2 Lite programmer, go to Step 12.
    - a. From the Connect Settings tab, set the Communication Tool to E1.
    - b. Click the Operation tab.
  - 12. Click Start to begin programming the board. A pop-up message appears and indicates progress during the programming process.
- 13. Programming is successful when the green OK message appears.
- 14. Power down the board and disconnect the 6-pin E2

Lite interface cable from the CN\_PGRM port of the baseboard or IO expansion board.

15. Close the RFP software.

Programming is now complete and the board is ready for use.

Figure 4: Renesas E2 Lite/E1 Programmer, USB Connector and Ribbon Cable



Figure 5: MicroTech III Baseboard Programming Port



Figure 6: New Custom Interface Cable for Renesas E2 Lite/ E1 Programmer



Figure 7: Inserting New Custom Cable Assembly 14-pin Connector to the Renesas E2 Lite/E1 Programmer



Figure 8: Renesas E2 Lite/E1 Programmer 6-Pin Connector Inserted Into the CN\_PGRM Port on Controller Board



#### Downloading to Baseboard #668105601 or I/O Expansion Module #668105702 with Renesas E8a Programmer

#### **Getting Started**

You will need the following:

- WSHP unit controller baseboard with hardware part number 668105601 or I/O expansion board with hardware part number 668105702.
  - Renesas E8a programmer hardware and software development kit. Specifications and links to the Renesas website provided in Table 7.
  - Computer with a Windows-compatible operating system. Refer to <u>www.renesas.com</u> for more information.
  - WSHP unit controller or I/O expansion module ".mot" file saved to your hard drive. Contact the ATS Technical Support Team at 315-282-6434 to request a copy of this software file.

#### Installing the Renesas E8a Programmer

- 1. Acquire the Renesas E8a programmer and interface cable as described in Table 7.
- 2. Download the latest Renesas Flash Development Toolkit software available at <u>www.renesas.com/us/en/products/</u>software-tools/tools/programmer/flash-development-toolkit-programming-gui.html.
- **NOTE:** It is important that you install the Flash Development Toolkit software before connecting the programmer to the USB port on your computer. The USB driver is automatically installed.
  - 3. Connect the E8a programmer to the USB port on your computer using the USB interface cable.
    - a. Connect the mini-plug of the USB interface cable to the USB I/F connector of the E8a.
    - b. Connect the plug of the USB interface cable to the USB port on your computer.
- **NOTE:** The E8a programmer is active once connected to the USB interface cable.
  - 4. Power down the unit controller.
  - 5. Connect the E8a programmer to the MCU:
    - a. Connect the interface ribbon cable to the user-side connector of the E8a programmer (Figure 9).
    - b. Carefully insert the Renesas E8a 14-pin connector to the interface cable PCB header pins labeled "E8a Emulator" (Figure 10).
    - c. Connect the 10-pin connector to the JTAG port on the control board.
    - d. Place the RUN/PRG jumper in the PRG position (Figure 25).
  - 6. Apply power to the unit controller.

Figure 9: Renesas E8a Programmer with USB and Interface Ribbon Cable Connected

![](_page_9_Picture_24.jpeg)

14-Pin Ribbon Cable Connection to Custom Interface Cable

Figure 10: Custom Interface Cable for Renesas E8a Programmer

![](_page_9_Picture_27.jpeg)

H1, 14-Pin Header to Renesas E8a Programmer

H2, 10-Pin Connection to Custom Interface Cable

- **NOTE:** Do not remove power from the unit controller or unplug the USB interface cable during this process. The power supplied from the board to the programmer could possibly damage the hardware.
  - 7. Open the Renesas Flash Development Toolkit (FDT) software using the "Flash Development Toolkit 4.09 Basic" (or newer) shortcut. The software must be configured if using the FTD software for the first time to download to the unit controller. Proceed to the next step to complete this process. Otherwise, skip to Step 20.

From the Options tab:

- 8. Select Auto Disconnect, Readback Verify, Erase Device Before Program, and File Over Warning (Figure 11).
- **NOTE:** The following screen shots and instructions may vary slightly with newer sotware versions.

#### Figure 11: Select Options

÷	Login		IGRAMMING Exit
	Batch Erase Mode		
	Compare Mode		E8a: (Disconnected)
~	AutoDisconnect		
	Readback Verify Request Checksum Erase Device Before Program File Over Warning		er2\Base_Brd\V6_2\2508060\WSHP_Ser2_
	Erasure of User Boot Area		→
	Security Protection Set ID Code Block Locking	>	am Flash
	Other Properties Settings	>	sh programming components
	New Settings		
	About		<pre>idmin] (C:\Program Files (x86)\Renesas\FDT-</pre>

From the Options tab:

- 9. Select New Settings.
- 10. Enter M38507 from the Choose Device and Kernel menu/Filter section type field (Figure 12).
- 11. Select 740 M38507F8A and click Next.

#### Figure 12: Select Device

	you wish to	o use with this	project f	rom the list belo	w.			
lter: M38507							Other.	
Туре	F	ull Name		Kernel Version	ı	Info		
740 Generic BOOT D	Nevice G	i38507F8A ieneric BOOT	Device	N/A				

From the Communications Port screen (Figure 13):

- 12. Select E8a from the Select Port drop-down menu.
- 13. Check "Set Reset pin as low when disconnecting."
- 14. Click Next.

#### Figure 13: Communications Port

Communications Port	:	×
	Use this page to select your desired communications port/interface. All settings may be changed after the project is created.	_
	Select port:	
21	Select an Interface type to connect to the target device with. Normally this will be "Direct Connection" or simply left blank.	
	Select Interface: Direct Connection	
14 13	✓ Set Reset pin as low when disconnecting	
	< Back Next > Cancel	

#### From the Connection Type menu (Figure 14):

- 15. Verify that Recommended Speeds and Use Default are checked.
- 16. Click Next.

#### Figure 14: Connection Type

Connection Type	×
Workspace Dates 5 Workspace Dates 5 Workspace Traductial co Display: 1008 at a Display: 1008 at a Dis	The FLASH Development Toolkit can connect to your device in a number of different ways. All the options on this page may be changed after the Project has been created.         Select Connection:
	< <u>B</u> ack <u>N</u> ext > Cancel

From the Programming Options menu (Figure 15):

- 17. Select Automatic Protection and Standard Messaging.
- 18. Select Yes for Readback Verification.
- 19. Click Finish.

#### Figure 15: Programming Options

![](_page_11_Picture_2.jpeg)

#### From the Options tab (Figure 16):

20. Select Other Properties Settings\Auto Send ID.

#### Figure 16: Other Properties

Login     GRAMMING     Exit       Batch Erase Mode     EBa: (Disconnected)       Compare Mode     EBa: (Disconnected)       AutoDisconnect     EBa: (Disconnected)       Readback Verify     Request Checksum       Frase Device Before Program     er2XBase_BrdWE_2X2508060 WSHP_Ser2_       File Over Warning     Erasure of User Boot Area       Security Protection     >       Set ID Code     Block Locking       Block Locking     Target Power       New Settings     Target Power	Opt	ions			
Batch Erase Mode     E8a: [Disconnected]       Compare Mode     E8a: [Disconnected]       AutoDisconnect     Readback Verify       Request Checksum     r2\8ase_Brd\V6_2\2508060 WSHP_Ser2_       File Over Warning     r2\8ase_Brd\V6_2\2508060 WSHP_Ser2_       Erasure of User Boot Area     security Protection       Set ID Code     m Flath       Block Locking     Target Power       ts     Auto Send ID		Login		GRAMMING	Exit
Compare Mode     EBa: [Disconnected]       AutoDisconnect     Readback Verify       Request Checksum     er2/Base_Brd/V6_2/2508060 WSHP_Ser2_       File Over Warning     er2/Base_Brd/V6_2/2508060 WSHP_Ser2_       Erasure of User Boot Area		Batch Erase Mode			
<ul> <li>AutoDisconnect</li> <li>Readback Verify Request Checksum</li> <li>Erase Device Before Program</li> <li>File Over Warning</li> <li>Erasure of User Boot Area</li> <li>Security Protection</li> <li>Set ID Code</li> <li>Block Locking</li> <li>Other Properties Settings</li> <li>Target Power</li> <li>ts</li> </ul>		Compare Mode		E8a: (Disconnected)	
	~	AutoDisconnect			
Request Checksum     er2\Base_Brd\\\\6_2\2508060\\\\SHP_Ser2_       Frase Device Before Program     er2\Base_Brd\\\6_2\2508060\\\SHP_Ser2_       File Over Warning     er2\Base_Brd\\\6_2\2508060\\\SHP_Ser2_       Erasure of User Boot Area	~	Readback Verify			
		Request Checksum			
<ul> <li>File Over Warning</li> <li>Erasure of User Boot Area</li> <li>Security Protection</li> <li>Set ID Code</li> <li>Block Locking</li> <li>Other Properties Settings</li> <li>Target Power</li> <li>Last Auto Send ID</li> </ul>	~	Erase Device Before Program		er2\Rase_Brd\\/6_2\2508060\w/SH	P Ser2
Erasure of User Boot Area Security Protection Set ID Code Block Locking Other Properties Settings New Settings Ls Auto Send ID	~	File Over Warning		02.0000_010110_2.2000000 # 01	
Security Protection > Set ID Code Block Locking Target Power New Settings ts Auto Send ID		Erasure of User Boot Area			•
Set ID Code m Flash Block Locking Target Power ts New Settings		Security Protection	>		
Block Locking       Other Properties Settings       New Settings         Auto Send ID		Set ID Code		am Flash	
Other Properties Settings         Target Power         ts           New Settings         Auto Send ID         L		Block Locking			
New Settings Auto Send ID		Other Properties Settings	>	Target Power	:5
		New Settings		Auto Send ID 🝃	
About (C:\Program Files (x86)\Renesas\F		About		dmin] (C:\Program Files (x86))	Renesas\FDT4.

From the ID Check menu (Figure 17):

- 21. Set all the ID bytes to FF.
- 22. Verify Enable Automatically Verifying ID is checked.
- 23. Click OK.

#### Figure 17: ID Check

![](_page_11_Picture_12.jpeg)

- 24. Select Other Properties Settings\Target Power.
- 25. Click "Memorize the settings in this dialog box until the work space is closed" and then click OK (Figure 18).

#### Figure 18: Target Power Settings

Supply power from E8/E8a/E1 to user target I	poard
- Power supplu from F8/F8a/F1	ок
C <u>3.3</u> V C <u>5.0</u> V	Cancel
-Information on the user-power supply-	
Be sure to select this check box if user power supply at 1.8 V is to be	

#### In the File Selection area (Figure 19):

- 26. Confirm Download File and User/Data Area are both selected.
- 27. Click on the right arrow then Browse to choose the Baseboard or IO Expansion Board controller binary software file (.mot file type). Contact the ATS Technical Support Team at 315-282-6434 to request a copy of this software file.
- 28. Click Open.
- 29. Click on the Program Flash button.

#### Figure 19: Select File for Download

	BA	SIC FILE PRO	GRAMMING		xit
Device :	M38507F8A	Port :	E8a: (Disconnected	0	
File Selecti	on				
Down     Down     Over     Over	load File				
🔽 User /	Data Area C:\McQ	.ay\W/SHP_Se	er2\Base_Brd\V6_2\250	08060 WSHP_Ser2_	►
🗖 User	Boot Area				Þ
		Progra	m Flash	Disco	nnect
lash Dev are prov	velopment Toolk ided without su	it and fla pport	sh programming c	omponents	
S: Wind	ows 10 (Windows ings Applied: M	8) [Non-A 38507F8A, has been s	dmin] (C:\Program File et to OFF	s (x86)\Renesas	s∖FDT
FCF Sett 18/E8a/E	L target power				

From the Select USB Device menu (Figure 20):

30. Select the E8a interface and then click OK.

#### Figure 20: Select USB Device

![](_page_12_Figure_4.jpeg)

The download process begins and messages appear in the status area at the bottom of the screen.

- Verify the Image Written to Device and Verification OK messages are displayed. These messages indicate a successful download.
- 32. Close the Renesas Flash Development Toolkit Simple software.
- 33. Power down the unit controller.
- 34. Disconnect the E8a programming cable from the board.
- 35. Place the RUN/PRG jumper in the RUN position.

Programming is now complete, and the board is ready to use.

#### Downloading to Baseboard #668105601 or I/O Expansion Module #668105702 with Segger Flasher5 Programmer

The following section describes how to download the unit controller baseboard or I/O expansion module using the Flasher5 (legacy) programming tool.

#### **Getting Started**

You will need the following:

- WSHP unit controller baseboard with hardware part number 668105601 or I/O expansion board with hardware part number 668105702.
  - Segger Flasher5 programmer hardware and software.
  - Computer with Windows-compatible operating system. Refer to <u>www.segger.com</u> for more information.
  - WSHP unit controller or I/O expansion module ".hex" file saved to your hard drive. Contact the ATS Technical Support Team at 315-282-6434 to request a copy of this software file.

#### Installing Segger Flasher5 Software

If the software has not been previously installed and configured, follow steps 1-5 below. Otherwise, skip to step 1 of the next section:

1. Download the most recent version of Flasher5 software

from www.segger.com/downloads/flasher.

- 2. Save the application to your hard drive.
- 3. Open the SetupFlasher application; click Next from the Welcome screen.
- 4. Click Next from the Choose Destination Location screen (Figure 21) to choose the default hard drive location.
- 5. Check all three boxes for available options as shown in Figure 23 and click Next.
- **NOTE:** The JTAG hardware and software tools referenced here are manufactured by Segger Microcontroller Systems. However, there are other manufacturers of JTAG-supported programming tools that would also be acceptable.

#### Figure 21: Choose Destination

覺 Choose Destination Lo	cation	$\times$
	Setup will install Flasher/V2.15 in the following folder. To install into a different folder, click Browse, and select another folder. You can choose not to install Flasher/V2.15 by clicking Cancel to exit Setup. Destination Folder C:\\Segger\Flasher/V215 Browse	]
	< <u>B</u> ack Next> Cancel	

#### Figure 22: Choose Options

🛃 Choose options		×
	Choose optional components that should be installed: Impact Install USB Driver for J-Link Choose options for creating shortcuts Impact Create entry in start menu Impact Add shortcut to desktop	
	< <u>B</u> ack <u>Next</u> > Cance	el 🛛

Once the Flasher software has been installed, follow the steps below to download the unit controller and I/O expansion module. The unit controller and I/O expansion module have different software files and must be downloaded separately.

**NOTE:** New unit controller software may be installed over an existing version. It is not necessary to uninstall software prior to loading a newer version.

- 1. Refer to Table 3 Table 6 to verify the latest version of software.
- 2. Remove power to the unit controller and the BACnet or LONWORKS communication module (if attached).
- 3. Download the unit controller software, which is a ".hex" file type and save to the hard drive. To request a copy of the software file, contact the ATS Technical Response Team at 315-282-6434.
- 4. Connect the Flasher5 hardware between the serial port on the computer (or a USB to serial converter) and the 10-pin connector on the unit controller or I/O expansion module. The Pin1 triangle on the Flasher cable (brown wire) must line up with the Pin1 triangle on the board. Refer to Figure 23 and Figure 24.
- 5. Connect power to the Flasher5 hardware.
- 6. If a room or return air sensor connected to TB1 or H9 on the unit controller, and jumper JP6 is shorted, remove this jumper.
- If a thermostat is connected to TB2 on the unit controller and jumper JP6 is not shorted, short-jumper JP6 to prevent the unit from running during the download process.
- Switch the Programming Jumper from the RUN position to the PRG position on the board being downloaded (unit controller baseboard or I/O expansion module) as shown in Figure 25.
- If there is an I/O expansion module connected to the unit controller being downloaded, verify that the Programming Jumper on the I/O expansion module is in the RUN position.
- 10. If the I/O expansion module is being downloaded, verify that the Programming Jumper on the unit controller is in the RUN position.
- Prior to launching Flasher, check the communication port (i.e. COM1 or COM2) to which the Flasher5 hardware is connected. The port number is required for Step 13. Follow these steps to determine the port number:

### Figure 23: Flasher Cable Orientation and Programming Jumper

![](_page_13_Figure_13.jpeg)

Figure 24: Flasher Cable Connected to JTAG Port

![](_page_13_Picture_15.jpeg)

Figure 25: Programming Jumper in the PRG Position

![](_page_13_Picture_17.jpeg)

- 12. Navigate to the Control Panel and select System/ Hardware/Device Manager/Ports.
- 13. Verify the communication port shown (i.e. COM1, COM2, etc).
- 14. Launch the Flasher program from the desktop shortcut icon.
- 15. If this is the first time downloading to the unit controller since installing the Flasher program, it is necessary to configure the software. If this has already been done, proceed to Step 24. Otherwise, follow Steps 16-23.
- 16. Go to the Options menu and select Communications. Select the communications port (as determined from Step 13) as shown in Figure 26 and then click OK.

Communication p	arameters	×
• UART Port	COM1	
O IP Addr:	255.255.255.255	
○ I <u>P</u> S/N:	0	S <u>e</u> arch
○ <u>U</u> SB S/N:	0	Se <u>a</u> rch
	OK Cance	el

#### Figure 26: Communications Parameters Menu

- 17. Navigate to the Options menu
  - a. Click on Device.
  - b. Click Select Device in the Device Properties window. See Figure 27.

#### Figure 27: Device Properties

Manufacturer	Renesas		Group M	416C/1N	
Vpp		RAM	3 KB	FLASH	68 KB
Vcc	4.2 - 5.5V Package Start / End bank		48-pin QFP (48P6Q-4	۹) (0.5mm pitch)	
			C Individual banks		
<u>S</u> tart Bank	Bank 00: 0xF000 💌 Bank 00: 0xF7FF 💌		[00] FLASH: 0xF0 [011 FLASH: 0xF8	00 - 0xF7FF 00 - 0xFFFF	
<u>E</u> nd Bank			[02] FLASH: 0xF0 [03] FLASH: 0xF8 [04] FLASH: 0xF8	000 - 0xF7FFF 000 - 0xF8FFF	
<u>I</u> nterface	Serial (In Targe	et) 🔽	[05] FLASH: 0xFE	000 - 0xFFFFF	
Speed	Fast	-			

When the Select Device window shown in Figure 28 appears:

- 18. Select Renesas in the Manufacturer drop-down box.
- 19. Select M38507 in the Group drop-down box.
- 20. Highlight the device M38507F8FP with 1KB RAM and 32KB FLASH and then click the OK button twice.
- 21. Navigate to the Options menu and select Passcode.

#### Figure 28: Select Device

anufacturer	Group	Device	RAM	FLASH	Vpp	Package
enesas	M38507	M38507F8FP	1 KB	32 KB	5V	42-pin FP (42P2R-A)
lenesas	M38507	M38507F8FP Boot area	1 KB	4 KB	5V	42-pin FP (42P2R-A)

- 22. Verify that all seven fields are set to FF as shown in Figure 29.
- 23. Click the OK button.

#### Figure 29: Passcode Configuration Menu

Passcode configura	tion	×
Passcode for serial co	ommunication	
The values below are expects these bytes. serial (in circuit) mode	e needed for serial programming mode. The target CPU's bootloader If these bytes are incorrect, you are unable to access the target chip in	
If your target chip is b	lank, the values do not matter.	
Number of ID bytes	ID bytes: (hex)	
7 💌	Id1 Id2 Id3 Id4 Id5 Id6 Id7 FF • FF • FF • FF • FF • FF •	
	OK Cancel	

- 24. Apply power to the unit controller. The Target VCC field should change to approximately 5.0 Volts as shown in Figure 30. If it does not, check the connection between the Flasher5 hardware and unit controller to verify that the cable is installed properly.
- 25. Prepare the software file for downloading.
  - a. Go to the File menu and select Open.
  - b. Browse to the appropriate file and click OK. The screen should populate as indicated in Figure 30.
- 26. To begin the download, select the Target menu and click Program and Verify. After a successful download, the screen shown in Figure 31 appears.

### Figure 30: Unit Controller when Applying Power and Hex File is Loaded

[ C:\McQı	ay\MTIII_WSHP\Ba	se_Brd\V3_1\2506	900 WSHP_BB_R3_1.hex	x - Flasher V2.12a	
Eile Edit	View Target Options	Help			
File			Target		
Range Bytes CRC ID bytes ID ASCII	8000 - FFFD 7D26 C038 FF FF FF FF FF FF I	TF FF	Device Range Interface Flasher CRC Flasher Status Flasher Vin Flasher firmware Result Curren <del>sde</del> Target VCC Bootloader	M38507F8FP 8000 - FFF Serial (In Target) 2401 Ready 18.3 Volt 2.12a for Flasher HW 5.30 S 2.12a for Flasher HW 5.30 S 	SIN 52378
Area Ad	ir. Len.	Gap Dat	ta (hex)		ASCII
0001 00 0002 00 0003 00 0004 00 0005 00	18000 007D10 1FFD4 000008 1FFF4 000008 1FFF2 000002 1FFFA 000004	0002C4 D8 000008 FF 000005 66 000005 D4 B8	12 3C 0C 3B A2 3 FC FF FF FF FF FF FF FF CI A2 CT 3A E8 D3 F B2 B2 00 80	9A A9 01 05 41 A2 F0 20 B FF F7	8 < . ; . ? f : 
Ready			UART: COM1, 115200 Bau	d Data rate [bytes/sec] 113	(Rx), 107(Tx) //.

#### Figure 31: Flasher Successful Download Screen

![](_page_15_Picture_2.jpeg)

- 27. Remove power from the unit controller and disconnect the Flasher5 hardware.
- 28. Switch the programming jumper back from the PRG position to the RUN position.
- 29. Repeat steps 1-28 to complete this process for the I/O expansion module, if one is attached.
- After both the unit controller and I/O expansion module have been programmed, return the unit controller baseboard JP6 configuration jumper to the state it was in before step 6.
- 31. Set the unit controller configuration properties to default values and calibrate the brownout reference setpoint as described in steps a-f. Applies only to the following unit controller software versions:
  - Enfinity Single Stage Compressor with software PN 2506900 and 2506901
  - SmartSource Single and Two Stage Compressor (Series2) with software PN 2508060 and 2508061
  - Enfinity Large Two Compressor (SS2C) with software PN 2508069 and 2508070
- **NOTE:** Only perform the following calibration procedures if the unit controller 24VAC voltage is within normal operating parameters.
  - a. Place the unit in the Service Mode by shorting the unit controller JP1 configuration jumper.
  - b. Tie a jumper wire from a ground connection to the unit controller unoccupied input ('U' terminal).
  - c. Apply power to the unit controller and wait for 15 seconds.
  - d. Remove power from the unit controller.
  - e. Remove the ground wire from the unit controller unoccupied input ('U' terminal).
  - f. Place the unit in the Normal Operating Mode by removing the JP1 configuration jumper.
- **NOTE:** It is recommended that these steps are performed each time new software is loaded in order to verify proper brownout calibration.

- 32. Apply power to the unit controller for a minimum of 30 seconds to confirm that the configuration has been saved properly.
- 33. If a "Serial EEPROM Corrupted" message appears, cycle power to the unit controller to clear the alarm.

#### **BACnet Communication Module**

This section describes how to do the following:

- 1. Install the programming tools needed for downloading BACnet communication module software.
- 2. Install and configure the BACnet communication module software

There are two programming tools compatible with the BACnet communication module. Both are referenced in Table 7. The instructions provided here support the J-Link hardware and J-Flash ARM software supplied by Segger Microcontroller. The second tool is the SAM-BA® boot programmer. SAM-BA is considred obsolete and is no longer supported. Refer to a previous version of this document (OM 1085-5 or older) for download and configuration using SAM-BA.

Figure 32 shows the important programming features of the BACnet communication module for reference during the configuration process.

### Figure 32: BACnet Communication Module Main Components

![](_page_15_Picture_28.jpeg)

20-pin connector (attaches to JTAG connection cable)

ATMEL microcontroller (part number indicated on the top of the chip)

## Downloading Segger J-Flash ARM Software and J-Link Hardware

You must first configure the J-Flash/J-Link programming tools for use with the BACnet communication module. Once complete, follow the steps to download the BACnet communication module software.

#### **Getting Started**

You will need the following:

BACnet communication module hardware PN 668105901
 installed on the WSHP unit controller

- The latest Segger J-Link hardware (J-Link Plus bundle, which includes JTAG ribbon cable and licensed hardware) from <u>www.segger.com/products/debug-probes/</u> <u>j-link/models/j-link-plus/</u>
- The latest Segger J-Link Software and Documentation pack for Windows from <u>www.segger.com/downloads/</u> <u>jlink/#J-LinkSoftwareAndDocumentationPack</u>
- Computer with a Windows-compatible operating system. Refer to <u>www.segger.com</u> for more details
- BACnet ".hex" file

Contact the ATS Technical Support Team at 315-282-6434 to receive the file

#### Installation and Setup

If the software has not been previously installed, follow steps 1-7 below. Otherwise skip to the next section.

- Download the most recent version of J-Link Software and documentation pack for Windows from <u>www.segger.com/</u> <u>downloads/jlink/#J-LinkSoftwareAndDocumentationPack</u>
- **NOTE:** Purchase the J-Link Plus bundle package to make sure the hardware is properly licensed for use with J-Flash software.
- **NOTE:** The following screen shots and instructions may vary slightly with newer sotware versions.
  - 2. Open the JLink\_Windows application and click Next from the welcome screen.
  - 3. Review the terms of the license agreement and click I Agree.
  - 4. Choose the optional component settings as shown in Figure 33.

#### Figure 33: J-Link Setup: Optional Component Settings

![](_page_16_Picture_15.jpeg)

- 5. Click Install.
- 6. Click Finish when prompted. Installation is now complete
- 7. Proceed to the next section.

### Launch and Configure the J-Flash ARM Software

Follow the steps below to launch and configure J-Flash ARM.

- **NOTE:** Performing the following configuration steps returns all BACnet network parameters to default values. Record any previously configured settings before proceeding.
  - Connect the J-Link hardware between the USB port on the computer and the 20-pin connector on the BACnet communication module. The notch on the J-Link cable fits into an opening on the 20-pin connector on the BACnet communication module (Figure 32).
  - 2. Launch J-Flash ARM software. The screen shown in Figure 34 appears.
- **NOTE:** These instructions are based on J-Flash v7.52x. The interface and configuration steps may vary slightly if using a different version of the software.
- **NOTE:** It is not necessary to create a new project if using J-Flash v7.54x or newer. In this case, skip this section and go to Configure J-Link Hardware.
  - 3. Select one of the two options from this screen and click Start J-Flash.

A project must be opened or created before J-Flash can proceed to the project settings screen.

#### Figure 34: J-Flash ARM Welcome Screen

SEGGER J-Flash V7.52d		
File Edit Target Options View Help		
roject information & X		
etting Value	Wetcome to - Fluch Wetcome to - Fluch Pease select one of the following start outpur: Or other were spect: Or other were spect: Do not show the message ages: Start Sheet	
og		6
Application log storted - 2-flash vr.230 (2-flash compiled Aug 17 2011 - 3.Linkbw.dl Vr.520 (2-flash compiled Aug 17 2021 - 3.Linkbw.dl Vr.520 (2-flash compiled Aug 17 2021) - List of flash devices read successfully (481 Reading MCU devices read successfully (8620 D	07131280) 1973580) 1971LERAN(C2Flash/Flash.csv] 9906cs)	

4. The Create New Project screen appears (Figure 35). Select the "..." to the right of the empty Target device field. This opens the Target Device Settings screen (Figure 36).

#### Figure 35: Create New Project

Target device	
Little Endian	~
Target interface	Speed
SWD -	4000 V kH:

 Locate the device number from the BACnet communication module's ATMEL chip (Figure 32).

Target Device	settings						1
Selected Device: AR	M7				Little Endian 👻	Core #0	
Manufacturer	Device	Core	NumCores	Flash Size			1
	~	~	Filter	Filter			
Unspecified	ARM7	ARM7	1	-			
Unspecified	ARM9	ARM9	1	-			1
Unspecified	ARM11	ARM11	1	-			1
Unspecified	BT5511	BT5511	1	-			1
Unspecified	Cortex-A5	Cortex-A5	1				1
Unspecified	Cortex-A7	Cortex-A7	1				1
Unspecified	Cortex-A8	Cortex-A8	1	-			1
Unspecified	Cortex-A9	Cortex-A9	1	-			1
Unspecified	Cortex-A12	Cortex-A12	1	-			
Unspecified	Cortex-A15	Cortex-A15	1	-			1
Unspecified	Cortex-A17	Cortex-A17	1	-			1
Unspecified	Cortex-M0	Cortex-M0	1	-			1
Unspecified	Cortex-M0+	Cortex-M0	1	-			1
Unspecified	Cortex-M1	Cortex-M1	1	-			
Unspecified	Cortex-M3	Cortex-M3	1	-			
Unspecified	Cortex-M4	Cortex-M4	1	-			
Unspecified	Cortex-M7	Cortex-M7	1	-			
Unspecified	Cortex-M23	Cortex-M23	1	-			
Unspecified	Cortex-M33	Cortex-M33	1				
Unspecified	Cortex-MS5	Cortex-M55	1	-			
Unspecified	Cortex-R4	Cortex-R4	1	-			
Unspecified	Cortex-R5	Cortex-R5	1				
Unspecified	Cortex-R8	Cortex-R8	1	-			
Unspecified	RX	RX	1	-			
Unspecified	RISC-V	RISC-V	1	-			
Unspecified	RV32	RISC-V	1	-			
Unspecified	RV64	RISC-V	1	-			
Abarr	A D ABAR O A	Carbou MA		knews - on vis			1.

Figure 36: Target Device Settings

 Find this number in the Device column, double-click on the row and click OK (Figure 37). The device disappears from this list once it has been located.

#### Figure 37: Target Device Search

Target Device	Settings				
elected Device: AF	RM7				Little Endian ▼ Core ≠0
Manufacturer	Device	Core	NumCores	Flash Size	
	v at91sam7s256	~	Filter	Filter	
Torochip	AT915AM75256	ARM7TDMI	1	256 KJB	

7. The name of the Target device appears in the Create New Project screen (Figure 38). Click OK.

Figure 38: Create New Project - Device Found

Microchip AT91SAM	
Little Endian	*
Target interface	Speed
JTAG 👻	4000 V kt

#### Figure 39: Project Information

SEGGER J-Flash V7.52d	-[*]		-	$\times$
File Edit Target Opti	ons View Help			
Project information	8 ×			
Setting	Value			
[-] General				
Project name				
Host connection	USB [Device 0]			
[-] TIF				
Туре	JTAG			
Init. speed	4000 kHz			
Speed	4000 kHz			
JTAG scan chain	Auto detection			
[-] Target				
NCU	Microchip AT91SAM7S256			
Core	ARM7TDMI	Drag & Drop data filo horo		
Endian	Little	Drag & Drop data nie nere		
Clock speed	Auto recognition			
Check core ID	Yes (0x3F0F0F0F)			
Use target RAM	64 KiB @ 0x200000			
(+) Flashbank No. 0				
Log				8
Application log started - J-Flash V7.52d (J-Fla - JLinkAwn.dll V7.52d (I Reading flash device lis - List of flash devices Reading MCU device list - List of MCU device list - Creating new project - New project created so	sh compiled Aug 17 2021 17:1 DLL compiled Aug 17 2021 17: t [c:\Program Files\Stockn\; read successfully (451 Devi and successfully (8620 Devic uccessfully	80] 04(277)71ash/71ash.cov] )		
List of MCU devices read succes	ssfully (8620 Devices)			

#### Configure J-Link Hardware

Follow these steps to establish the correct hardware settings if J-Flash ARM has not been previously configured.

- 1. Navigate to the Options menu and select Project Settings.
- 2. Select USB Device 0 from the General tab (Figure 40).
- 3. Select Engineering for the User interface mode, then click OK.

#### Figure 40: Project Settings – General Tab

General		-	-	
Target Interface MCU Init. steps Exit steps Flash Production Performance	juliante		J-Flash is SEG software. It requires a li SEGGER (http: This software memory of sev and external f	GER's production programming cense, which can be obtained from s://www.segger.com/) is capable of programming the flash reral MCUs ashes connected to the MCU, as
	Connection type		wei.	
	USB	Device	• 0	
	O USB SN			
	O TCP/IP			
	Flasher modu	le selection		
	Info			
	Module 1	Module 9	Module 17	
	Module 2	Module 10	Module 18	
	Module 3	Module 11	Module 19	
	Module 4	Module 12	Module 20	
	Module 5	Module 13	Module 21	
	Module 6	Module 14	Module 22	
	Module 7	Module 15	Module 23	
	Module 8	Module 16	Module 24	
	All	None	Invert	
	User interface more	de		
	Engineering ()	More options, ty	cally used for set	up)
		a and and having	Accord for and	ation)
	O simplified (Les	is options, typica	iny used for produc	coony

- 4. Click on the Target Interface tab (Figure 41).
  - a. Select JTAG from the drop-down box.
  - b. Select 10kHz from theTAG speed before init steps section drop-down box.
  - c. Choose Auto detection from JTAG scan information.
  - d. Select 4000 kHz from JTAG speed after init steps section drop-down box.
  - e. Click OK when all selections have been made.

#### Figure 41: Target Interface Tab

General Target Interface	Selected target interface: JTAG	-
<ul> <li>MCU Init. steps</li> <li>Exit steps</li> <li>Flash</li> <li>Production</li> <li>Performance</li> </ul>	JTAG speed before init steps Auto selection Adaptive docking Initial formation Adaptive docking Initial formation Auto detection Simple configuration Detailed configuration	JTAG speed after init steps Auto selection Adaptive clocking 4000 kHz Detect

- 5. Click on the MCU tab (Figure 42).
- The Device inforormation should automatically display. If not, click on the "..." button in the Device area to select the Atmel device, AT91SAM7S256.
- Verify the following options are selected and click OK when finished:

- a. The Check core ID box is selected.
- b. 200000 is in the Addr box.
- c. 64KB is selected from the drop-down menu.
- d. Clock speed is set to Auto detection.

#### Figure 42: MCU Tab

Target Interface	Target devic	e
MCU	Device	Microchip AT91SAM7S256
Init. steps Exit steps Flash	Core Endianness	ARM7TDMI Little Endian 😙
Performance	Target optio	ns
	Use J-Lir	nk script file
	Check	core ID
	ID 3F	DFOFOF
	Mask FF	FFFFF
	Target RA	M settings
	Addr 200	0000
	Size 64	KiB 🔻
	Clock spee	ed detection
	U TIACU	
	Target Interface MCU Init. steps Exit steps Flash Production Performance	Target Interface MCU Init. steps Flash Production Performance Target devic Device Device Core Endianness Core Endianness Target optio Use 3-Lii ✓ Check ID Size 64 Clock spec ● Auto 0 ○ Fixed

- 8. Click on the Flash tab (Figure 43) and verify the following:
  - a. Flash bank = 0 (Internal flash)
  - b. Base Address = 00100000
  - c. Organization = 32
  - d. Bits x = 1 Chip
  - e. In the Sector selection, scroll down to the bottom of the list and do the following:
    - i. Check Sector[10211]: 0x0013FD00 -0x0013FDFF
    - ii. Uncheck the last two address ranges:
      - Sector[1022]: 0x0013FE00 0x0013FEFF
    - Sector[1023]: 0x0013FF00 0x0013FFFF
  - f. Click OK when all selections have been made

#### Figure 43: Flash Tab

![](_page_19_Picture_2.jpeg)

- 9. Click on the Production tab (Figure 44) and verify the following:
  - a. Erase, Program, Verify, and Start application boxes are checked.
  - b. Selected sectors appears in the drop-down box next to Erase.
  - c. Via reset pin appears in the drop-down box next to Start application.

#### Figure 44: Production Tab

General Target Interface MCU	Target Pow Power sour	er Supply ce: Non	e 🔻						
Init. steps Exit steps Flash Production Performance	Reference voltage settings  Enable VTref monitor  Fixed VTref								
	Program	serial nu	mber						
	Address								
	Length	4							
	Next SN	1							
	Increment 1								
	Actions performed by 'Production Programming'								
	Erase			selected sectors 🔻					
	Program	n							
	Verify								
	Start a	pplication		via reset pin	•				
	Secure	chip							
	Disconr	ect after	wards						
	Overrid	e timeouts	s						
	Erase	15000	ms						
	Program	10000	ms						

- 10. Click on the Performance tab and verify the following selections those displayed in Figure 45.
- 11. Click OK to exit the Project Settings menu.

#### Figure 45: Performance Tab

G	ieneral	On "Erase selected sectors" (F3)
~ N	arget Interface ICU	Perform blank check
	Init. steps Exit steps	On "Erase chip" (F4)
F	lash	Perform blank check
P	erformance	On "Program" (F5)
		Skip blank data
		On "Verify" (F8)
		Perform verify via CRC

- 12. Navigate to the Options menu. Select the Global Settings tab (Figure 46) and verify the following:
  - a. The General log level is set to Level 2.
  - b. The Save Project file on close is checked.
  - c. The Load most recent project is selected.
- 13. Click OK to exit the Global Settings menu.

#### Figure 46: Global Settings

Logging	
General log level:	Level 2 🔻
Enable J-Link logt	file
Enable J-Flash log	gfile
Projets	
Save Project file	on close
Action on J-Flash sta	rt
Load most recent	t project
O Show New Project	ct Dialog
O Show Welcome D	ialog (default)

### Downloading BACnet Communication Module Software with J-Flash ARM

#### \land CAUTION

The following procedure returns all BACnet parameters to factory default values. It is recommended that existing parameters are saved prior to starting this process. See the Appendix in the MicroTech III WSHP BACnet Communication Module Installation Manual, IM 928, and MicroTech III WSHP Protocol Document, ED 15103 (both available on www. DaikinApplied.com) for additional information.

Follow these steps to use J-Flash ARM to download the BACnet communication module's .hex software file:

- 1. Apply power to the unit controller.
- 2. Navigate to Target and select Connect from the main J-Flash screen.
- Verify connection by viewing the log message at the bottom of the screen that indicates Connected Successfully.
- 4. Close any open data files like the one highlighted in red (Figure 47).
- 5. Select Open data file... from the File menu.

#### Figure 47: Successful Connection Message

Eile Edit View	h V6.60d - [C:\Users\Schm	iidTC\AppData\I	Roami	ng\SEG(	GER\D	efault.jf	lash]											-			×
Project - Defi	sult	C:\McQu	sy∖WS	HP_SS20	C\BAC	net\250	8071 V	VSHP_	_SS2C	BAC	net V1	1_3.HI	EX								8
Name Host connection Target interface Init JTAG speed JTAG speed JTAG speed LTAG speed Endan Clock speed Check core ID Use target RAM Flash memory Base address Flash size	Value         Value           USB (Device 0)         JTA6           JTA6         10 H4           Auto recognition         Auto recognition           Auto relation         Auto relation           Auto recognition         Auto relation           Auto relation         Auto relation           Auto relation <td< th=""><th>Address: Rddress: 100000 100010 100020 100020 100050 10</th><th>0x1000 0 30 9F 5F 10 90      F0 FF 91 80</th><th>1         2           FØ         9F           FØ         9F           FØ         21           FF         25           F11         20          </th><th>3 E5 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1</th><th>4 9 30 00 F 14 D FE F 60 1 </th><th>4 6 6 9 7 7 7 7 7 7 7 7 7 7 7 7 7</th><th>7 E5 E6 00 </th><th>8 30 D2 18 04 BC      00 01 8A 8A</th><th>9 40 F0 00 48             -</th><th>A 9F 21 9F 18 11 </th><th>B E5 ( E3 2 E5 ( 00 ) 00 - </th><th>C 04 20 0F 08 </th><th>D 1 D0 4 D0 9 E0 A 27 1 </th><th>E 1 9 F 9 F 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0</th><th>F 1 25 21 25 21 25 21 25 20 25 23 23 23 23 23 25</th><th>ASCI 34 </th><th>I 3I </th><th>ве</th><th></th><th></th></td<>	Address: Rddress: 100000 100010 100020 100020 100050 10	0x1000 0 30 9F 5F 10 90      F0 FF 91 80	1         2           FØ         9F           FØ         9F           FØ         21           FF         25           F11         20	3 E5 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1	4 9 30 00 F 14 D FE F 60 1 	4 6 6 9 7 7 7 7 7 7 7 7 7 7 7 7 7	7 E5 E6 00 	8 30 D2 18 04 BC      00 01 8A 8A	9 40 F0 00 48             -	A 9F 21 9F 18 11 	B E5 ( E3 2 E5 ( 00 ) 00 - 	C 04 20 0F 08 	D 1 D0 4 D0 9 E0 A 27 1 	E 1 9 F 9 F 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	F 1 25 21 25 21 25 21 25 20 25 23 23 23 23 23 25	ASCI 34 	I 3I 	ве		
		100130 100140 100150 100160 100170	8H BC 59 A4 7B	00 00 03 9F 0F 86 13 9F 4D 00	E5 E2 E5 EB	03 0 54 0 82 4 E0 0 09 2	0 50 1 86 D 00 0 A0 0 A0	ES EB E3 E3	54 1A F8 D0 90	00 20 56 0D 13	00 40 9F 80 9F	E3 1 E5 1 E3 6 E5 6	80 84 12 85 62	6H 9 13 9 20 A 00 8 0F 8	F E Ø E Ø E 6 E	5 5 30 2	с м	 	b		•
JTAG chain dete     #0 Id: 0x3F0F0F     Executing init sec     Initialized succe     Adaptive clocking     Auto JTAG speec     Target interface s     CPU clock freque     J-Unk found 1 JT     Connected succe     <	zion found 1 devices: 0F. IRLen: 04. ARM/7TDMI C uence stafuly not supported for selected C i: 8000 kHz peed: 8000 kHz peed: 8000 kHz Auto detected) Ac device. Core ID: 0x3F0F0 stafuly	ore PU core. Only sup FOF (None)	ported	for -S co	res.															>	<ul> <li>•</li> <li>•</li> </ul>

- 6. Browse to the location on the hard drive where the BACnet communication module .hex file has been saved.
- 7. Click on the ".hex" file and select Open.
- 8. Verify that the Log screen message indicates the data file has opened successfully (Figure 48).

#### Figure 48: Successful Data File Open Message

Opening data file [C:\McQuay\WSHP\_Ser2\BACnet\2508062 WSHP\_Ser2 BACnet V6\_4.HEX] ... - Data file opened successfully (96312 bytes, 2 ranges, CRC of data = 0xA5A1CF29, CRC of file = 0xF52A2D52)

- 9. Remove (if connected) the jumper from pin 1 and pin 2 on J2 of the BACnet communication module.
- 10. Press the F7 key to begin production programming.
- **NOTE:** If this does not work, another option is to use Production Programming from the Target Interface menu.
  - 11. Click OK when the screen shown in Figure 49 appears and programming is complete.

### Figure 49: Target Erased, Programmed, and Verified Successful

![](_page_20_Picture_22.jpeg)

- 13. Remove the JTAG cable connection from the BACnet communication module.
- 14. Press and hold the Default and Reset push buttons on the BACnet communication module as shown in Figure 32.
- 15. Apply power to the unit controller.
- 16. Release the Reset push button, and continue to hold the Default push button until all four BACnet communication module LEDs (D1 to D4) are on steady (Figure 32).
- 17. Verify that application is operating correctly by observing the following LED activity:
  - a. LED D1 flashes on and off approximately every half second. This indicates that the application is running.
  - LED D2 flashes in bursts approximately every half second. This indicates communication between the unit controller and the BACnet communication module.
  - c. LED D3 flashes for each message transmitted to the MS/TP network.
  - d. LED D4 flashes for each message received from the MS/TP network.

All BACnet communication parameters have now been returned to default settings. Reconfigure network values as required. See ED 15103 (<u>www.DaikinApplied.com</u>) for further details.

**NOTE:** Refer to the Troubleshooting Guide and FAQ section. If necessary, contact the Controls Customer Support group at 866-462-7829 for technical assistance.

### LONWORKS Communication Module

The following section describes how to download and commission the LONWORKS communication module software files (XIF - eXternal Interface File and NXE file) for the WSHP unit controller. This is done using industry-standard LONWORKS-specific software such as Echelon<sup>®</sup> LonMaker. It is assumed that the user has the application installed and is familiar with the use of LonMaker or equivalent software.

#### **Getting Started**

You will need the following:

- LONWORKS communication module installed on unit controller with PN 668105801
- XIF/NXE files for the LONWORKS communication module, available on <u>www.DaikinApplied.com</u> or www.lonmark.org
- LONWORKS application such as Echelon<sup>®</sup> CT (Commissioning Tool), available at, available at <u>www.echelon.com</u>.

Note that a 32-bit version of Visio software and also .NET v4.8 Windows framework is needed. It is also recommended that .NET v3.5 remain installed in order to support other PC applications not related to the Echelon CT Tool.

- · Twisted pair shielded cable with 3-pin connector
- Echelon TP/FT-10 to USB network interface, U10 or similar
- Computer with Windows-compatible operating system Refer to <u>www.echelon.com</u> for details
- Standard web browser for access to <u>www.DaikinApplied.com</u>

#### Installation and Setup

- 1. Verify that LONWORKS software such as LonMaker SR4 or CT is installed.
- Verify that a LONWORKS communication module is properly installed on the unit controller. Refer to <u>IM 927</u>, available on <u>www.DaikinApplied.com</u>.
- Download the LonWORKS communication module XIF/NXE files to your hard drive. Refer to <u>www.DaikinApplied.com</u> or <u>www.lonmark.org</u>.
- 4. Connect TP/FT-10 network channel to the computer using the USB network interface.

#### FIGURE 50: LONWORKS Interface Name

🌒 LonWorks Interfa	ices	- 0	x c
Interface View Di	agnostics Settings Help		
Add - Wink	♥ 🚳 🚔 🔏 🛠 Test Comm Service Reset Remove		
SELON1	Properties		
	Name LON1		
	Description USB Network	Interface added Mon May 06 08:50:37 201	19
	Serial Number CC404102		
	Transceiver FT 10		
	Buffer Configuration		
	Application Input Buffers     Count: 3. Size	: 66	
	Application Output Buffers     Non-priority (	Count: 3. Priority Count: 1. Size: 66	
	Network Input Buffers     Count: 7, Size	2: 66	
	Network Output Buffers     Non-priority 0	Count: 2, Priority Count: 1, Size: 66	
	Buffer Memory 1122		
	Required Memory 1122		
	Name The name of this USB network interface.		
< > > Ready		Version 5.00.010	(LNS 4.20)

- Determine the LONWORKS Interface name for later reference. Do this by navigating to Control Panel/ LONWORKS Interfaces (Figure 50).
- 6. Insert the other end of the TP/FT-10 connector to the LONWORKS communication module pins A and B (Figure 51).
- 7. Apply power to the unit controller.

#### FIGURE 51: Communication Module Main Components

![](_page_21_Figure_24.jpeg)

LonWorks Software Version Label TB1 Network Connector Pin3: No Connection Pin2: Signal B / -Pin1: Signal A / +

**NOTE:** If device has not been commissioned, the yellow Service LED flashes ON/OFF once every half second. See Troubleshooting Guide and FAQ.

#### Configuring the LONWORKS Communication Network

The following section describes how to create a LONWORKS communication network drawing and import the WSHP Device Template into the network using CT.

- 1. Open the Echelon IzoT Commissioning Tool. The Design Manager screen appears (Figure 52).
- **NOTE:** The following screen shots and instructions may vary slightly with newer sotware versions.

#### Figure 52: IzoT Commissioning Tool Design Manager

	New Network			
ECHELON	Network name:			
	LonTest 1		Create Network	options
	Existing Network			
	Drawing directory:		Open Network	C Show all options
	LonTest	•	Open Copy	1
	Drawing name:			1
	LonTest.vsd	*	Delete	]
	Database name:		Defragment Database	1
	LonTest	•	Start IzoT Net Server	1
			Backup	
Subject to turne of licence spreament	Drawing base path		Restore Import	
Copyright (c) 1996-2018 Echelon Corp. All Rights Reserved	C.1Lm/Drawings			▼ Add

- 2. Either create a new network or select an existing network.
  - a. To select an existing network:
    - i. Select the network from the Drawing directory drop-down menu.
    - ii. Click on Open Network.
    - iii. Proceed to the Commissioning the LONWORKS Communication Module section.
  - f. To create a new network:
    - i. Enter a name in the Network name field and then click Create Network.
- Select the Network Interface Name (Figure 53) as determined from step 5 of the Installation and Setup section (Figure 50).

#### FIGURE 53: LONWORKS Interface Name

-	Network attached			
ECHELUII.	Network Interface name			
	LONI	•		
IzoT <sup>®</sup> CT				
	_			
	Skip network interface prompt wi	hen re-opening this drawing		
	✓ Skip network interface prompt will	hen re-opening this drawing		
	✓ Skip network interface prompt with the state of the	ten re-opening this drawing		
	☑ Skip network interface prompt wi	ten re-opening this drawing		
	⊽ Skip network interface prompt wi	ten re-opening this drawing		
	✓ Skip network interface prompt with the state of the	hen re-opening this drawing		
	G Skip network interface prompt wi	hen re-opening this drawing		

- 4. Click Next.
- 5. Verify the Management Mode is OnNet and click Finish (Figure 54).

#### Figure 54: Management Mode

Onnet/Offnet		
ECHELON.	Management Mode  C OnNet (propagate device changes to the network)  C OnNet (are device changes for later processing)	
	$\overline{arphi}$ Skp this prompt when re-opening this drawing	
	< Back Next > Finish Cancel	Help

- 6. A screen similar to Figure 55 appears.
- 7. Drag the Device icon (shown on the left-hand side of the image in Figure 55) to the center of the screen.

#### Figure 55: LNS Network Interface Screen

🖷 🗄    ∿ ″    🖋 ॐ    🚳 ፣	Visio Professional	Schmid, Timothy C 🖭 — 🔲 🗙
File Home Insert Draw Design	Data Process Review View Add-ins Help $ ho$	Tell me 🖻 Share 🖓 Comments
▲         Arial         •         12pt.         ▲         ▲           Poste         ★         ★         B         I         U         abc         Aa =         ▲         +	$ \begin{array}{ c c c c c } \hline \hline$	Align Position
Clipboard Font r	Paragraph rs Tools Shape Styles r	Arrange Editing
0		
Shapes ( Terch Arges ) Lookout Muyes 10 Lookout Muyes 10 Lookout Muyes 10 To Charlow Bayes 10 Matchaller Back Shapes 10 Matchaller Backer Shapes 10 Match	CpanLNS Network Information Channel 1	
Page 1 of 1 English (United States)		

- 8. The New Device Wizard then opens (Figure 56).
- 9. Provide a Device name and then select Create new device template.
- 10. Click Next. The screen shown in Figure 57 appears.

#### Figure 56: New Device Template

New Device Wiz	ard		×
ECHELON.	Device name	avices to create:	
	Commiss	ion device	
FO	Device Te	mplatenew device template	
	Channel Channel	etect channel	
O N	Type:	TP/FT-10	
	Name:	Channel 1	
	< Bac	k Next > Finish Cancel Help	

- 11. Ensure that Load XIF is selected.
- 12. Click Browse to locate the LONWORKS communication module XIF file from the hard drive and then click Finish.

#### Figure 57: XIF Definition

New Device Wizard				×
Current template:				
Device name(s):	MTNI WSHP			
External Interface Defini	tion			1
C Upload from device				
Load XIF File:	C:\Program Files (x86)	\LonWorks\import\McQi	Browse	
	Template name:	MTIIUC_WSHP		
C Existing template	Name:	MTIIIUC_FCU	Ţ	
				1
	< Back Next >	Finish	Cancel	Help

- 13. The network drawing screen now displays the new device (Figure 58).
- 14. The MTIII WSHP LONWORKS device appears in yellow, indicating the device is decommissioned.

#### Figure 58: Network Drawing

![](_page_23_Picture_13.jpeg)

#### Commissioning the LONWORKS Communication Module

The LONWORKS communication module is ready for network commissioning after the Device Template has been properly loaded into CT using the XIF file and the WSHP device exists in the network drawing area (Figure 58).

Follow these steps to begin the commissioning process:

- 1. Right click on the decommissioned LonWorks device and select Commissioning and then left click on Commission.
- 2. Select both Load application image and Update firmware in device to match application image (Figure 59).

#### Figure 59: Application Image Details

Device name(s):	
Device name(s): MTII WSHP	
✓ Load application image	
<ul> <li>Update firmware in device to match application image</li> </ul>	
OdDensors Files (c00W) and (cde)/manifeling	
mage name: C:NProgram Files (xoo)/Lonworks/import/wcduay/within	Browse
XIF name: C:\Program Files (x86)\LonWorks\import\McQuay\MTIII	Browse

 Click Browse to locate the LONWORKS communication NXE Image file from where it was saved and then click Next.

- 4. Verify that the following are all selected from the screen shown in Figure 60:
  - State setting = Online
  - Source of CP Values setting = Defaults and Include NV type CPs
  - Device Specific CPs setting = Update with other CPs
- 5. Click Next.

#### Figure 60: Device Details

State C Default C Offline C Online C Disable	Source of CP Values C OpenLNS database Defaults C Include NV type CPs C Application image file	Device Specific CPs     Oo not update     Update with other CPs     Upload from new app image     Preserve device values	

6. Verify that Service pin is selected and then click Finish (Figure 61).

#### Figure 61: Service Pin Screen

New Device Wiza	rd		×
Device identification	on method		
Device name(s):	MTILWSH	P	
Service pin	,		
C Manual Ner	uron ID:	00000000000	

- 7. The screen in Figure 62 appears.
- 8. Press the service pin button on the LonWorks communication module. Refer to Figure 51 for the location of the service button.

#### Figure 62: Service Pin Entry

Echelon IzoT Commissioning Tool	
Please press the service pin o	on device 'MTIII WSHP'
Options Display data from service pin Filter on program ID Filter on channel	Total Received
Cancel Continue	Help

At this point, the application image starts loading the LONWORKS communication module. This process takes approximately one minute (Figure 63).

The MTIII WSHP device changes color to green which indicates successful commissioning (Figure 64).

#### Figure 63: Loading Application

Echelon IzoT CT		$\times$
SMUL	Loading 'MTIII WSHP' application image	
$\Delta M M_{ZZ}$		
	Cancel	

Figure 64: LONWORKS Communication Module – Commissioned

![](_page_24_Picture_20.jpeg)

In order to program another LONWORKS device, it is necessary to first decommission the existing device by following these three steps:

- 1. Right click on the commissioned LONWORKS device
- 2. Select Commissioning
- 3. Left click on Decommission

## Troubleshooting Guide and FAQ

The following Troubleshooting Guide is intended to be a helpful reference and source of supplemental information. It provides answers to common questions about the controls subjects covered in previous sections of this manual. The troubleshooting topics are organized into five categories: WSHP equipment configuration, unit controller and I/O expansion modules, BACnet or LONWORKS communication modules, Flasher tools, and finally J-Link tools.

### **WSHP Equipment Configuration**

This section describes the equipment options for each model. Table 8 - Table 19 show the hardware jumper settings used by the unit controller and I/O expansion module and summarize the valid configuration options by model.

#### Enfinity Single Stage Compressor Control

#### Table 8: Unit Controller Configuration Jumpers for Enfinity Single Stage Compressor

Unit Controller Option	Hardware Jumpers	Setting	Description
Normal / Taat Mada	ID1	JP1 = Open	Normal Operation
Normal / Test Mode	JFI	ardware JumpersSettingDescriptionJP1JP1 = OpenNormal OperationJP1JP1 = ShortedService / Test ModeJP2JP2 = OpenContinuous Fan Operation (ON)JP3JP3 = OpenWater Loop FluidJP4JP3 = ShortedGlycol Loop FluidJP4JP4 = OpenFault de-energizes alarm output to 0VAC.JP5JP5 = OpenShort Range: -3 to +3 °F (-1.67 to +1.67 °C)JP6JP6 = OpenThermostat ControlJP7JP6 = OpenThermostat ControlJP7JP7 = OpenJP8JP8 = OpenFormal Control	Service / Test Mode
Ean Operation	102	JP2 = Open	Continuous Fan Operation (ON)
	JFZ	mpersSettingDescriptionJP1 = OpenNormal OperationJP1 = ShortedService / Test ModeJP2 = OpenContinuous Fan Operation (ON)JP2 = ShortedCycling Fan Operation (AUTO)JP3 = OpenWater Loop FluidJP3 = ShortedGlycol Loop FluidJP4 = OpenFault de-energizes alarm output to 0VAC.JP5 = OpenShort Range: -3 to +3 °F (-1.67 to +1.67 °C)JP5 = ShortedLong Range: 55 to 95 °F (12.78 to 35 °C)JP6 = OpenThermostat ControlJP7 = Open—JP8 = OpenMore Sensor ControlJP8 = Open—	Cycling Fan Operation (AUTO)
Loop Eluid	ID3	JP3 = Open	Water Loop Fluid
Loop Fidia	JFO	Impers     Description       JP1 = Open     Normal Operation       JP1 = Shorted     Service / Test Mode       JP2 = Open     Continuous Fan Operation (ON)       JP2 = Shorted     Cycling Fan Operation (AUTO)       JP3 = Open     Water Loop Fluid       JP3 = Shorted     Glycol Loop Fluid       JP4 = Open     Fault de-energizes alarm output to 0VAC.       JP4 = Shorted     Fault energizes alarm output to 24VAC.       JP5 = Open     Short Range: -3 to +3 °F (-1.67 to +1.67 °C)       JP5 = Shorted     Long Range: 55 to 95 °F (12.78 to 35 °C)       JP6 = Open     Thermostat Control       JP7 = Open     —	
Alorm "A" Terminal Delarity Select (v2.1.8 Nower)		JP4 = Open	Fault de-energizes alarm output to 0VAC.
Alam A Terminal Folancy Select (VS. 1 & Newer)	JF4	SettingDescriptionJP1 = OpenNormal OperationJP1 = ShortedService / Test ModeJP2 = OpenContinuous Fan Operation (ON)JP2 = ShortedCycling Fan Operation (AUTO)JP3 = OpenWater Loop FluidJP3 = ShortedGlycol Loop FluidJP4 = OpenFault de-energizes alarm output to 0VAC.JP5 = OpenShort Range: -3 to +3 °F (-1.67 to +1.67 °C)JP5 = ShortedLong Range: 55 to 95 °F (12.78 to 35 °C)JP6 = OpenThermostat ControlJP7 = OpenJP8 = Open	Fault energizes alarm output to 24VAC.
Boom Songer Setneint Adjust Bonge	ID5	JP5 = Open	Short Range: -3 to +3 °F (-1.67 to +1.67 °C)
Room Serboint Adjust Range	JF0	JP5 = Shorted	Long Range: 55 to 95 °F (12.78 to 35 °C)
Thermestat / Deem Concer	IDC	JP6 = Open	Thermostat Control
Thermostat / Room Sensor	JPO	JP6 = Shorted	Room Sensor Control
Not Used JP7		JP7 = Open	_
Not Used	JP8	JP8 = Open	_

#### Table 9: I/O Expansion Module Configuration Jumpers for Enfinity Single Stage Compressor

I/O Expansion Module Option	Hardware Jumpers	Setting	Description
Number of Compressors	ID1	JP1 = Open	Single Compressor
Number of Compressors	JEI	JP1 = Shorted	Dual Compressor
Debumidification	כסו	JP2 = Open	None
Denumication	JF2	JP2 = Shorted	HGR Dehumidification
		JP3 = Open	None
		JP4 = Open	None
Secondary Heating		JP3 = Shorted	Supplemental Electric Liest
Secondary Heating	JF3 & JF4	JP4 = Open	Supplemental Electric reat
		JP3 = Open	Deilerless Flastric Llast
		JP4 = Shorted	Doneness Electric Heat
		JP5 = Open	Single Speed Fan
		JP6 = Open	Single Speed Fan
Fan Speed Selection		JP5 = Shorted	Two Speed For
Fan Speed Selection	JP3 & JP0	JP6 = Open	Two Speed Fan
		JP5 = Open	These Grand For
		JP6 = Shorted	Inree Speed Fan
Not Used	JP7	JP7 = Open	_
Lood Comproseer Select (v2.1.8 Nower)		JP8 = Open	Compressor #1 is Lead
Lead Compressor Select (V3.1 & Newer)	JFO	JP8 = Shorted	Compressor #2 is Lead (Dual Compressor Models Only)

Model Number	Number of Com- pressors	1 Speed Fan	2 Speed Fan	3 Speed Fan HGR Dehumid		Supplemental Electric Heat	Boilerless Elec- tric Heat
1 <sup>1</sup>	Single	Х	—	—	—	—	—
2	Single	Х	—	—	X	—	—
3	Single	Х	—	—	—	Х	—
4	Single	Х	—	—	—	—	X
5	Single	Х	—	—	X	Х	—
6	Single	Х	—	—	X	—	X
7	Single	—	Х			—	—
8	Single	—	Х	—	X	—	—
9	Single	—	Х	—	—	Х	—
10	Single	—	Х	—	—	—	X
11	Single	—	Х	—	X	Х	—
12	Single	—	Х	—	X	—	X
13	Single	—	—	X	—	Х	—
14	Single	—	—	X	—	—	X
15	Single	_	_	X	X	X	_
16	Single	_	_	X	X	_	X
17	Dual	Х	_	—	—	_	—
18	Dual	Х	_	—	X	_	—

#### Table 10: Model Types and Options for Enfinity Single Stage Compressor

<sup>1</sup> Except for the Enfinity single-compressor WSHP with no other options selected, all Enfinity models require both the unit controller and I/O expansion module. <sup>2</sup> An "X" means that option is available for the corresponding WSHP model.

#### SmartSource Single and Two Stage Compressor and SmartSource Compact

### Table 11: Unit Controller Configuration Jumpers for SmartSource Single and Two Stage Compressor (Series2) and SmartSource Compact

Unit Controller Option	Hardware Jumpers	Setting	Description
Normal / Toat Mada	ID1	JP1 = Open	Normal Operation
Normal / Test Mode	JET	Setting         Descript           JP1 = Open         Normal O           JP1 = Shorted         Service //           JP2 = Open         Continuou           JP2 = Shorted         Cycling F           JP3 = Open         Water Loo           JP3 = Open         Water Loo           JP3 = Open         LWT Free           JP4 = Open         LWT Free           JP5 = Open         Short Rar           JP5 = Shorted         Long Rar           JP6 = Open         Thermost           JP6 = Shorted         Room Se           JP7 = Open         Allow Cor           JP7 = Shorted         Disable C           JP8 = Open         I/O Expar           JP8 = Open         I/O Expar	Service / Test Mode
Ean Operation	102	JP2 = Open	Continuous Fan Operation (ON)
Fail Operation	JFZ	JP2 = Shorted	Cycling Fan Operation (AUTO)
Loop Eluid	102	JP3 = Open	Water Loop Fluid
Ecop Fluid	3F3	JP3 = Shorted	Glycol Loop Fluid
Franza Fault Bratastian	ID4	JP4 = Open	LWT Freeze Fault Protection is Disabled
Fleeze Fault Flotection	JF4	JP4 = Shorted	LWT Freeze Fault Protection is Enabled
Deem Concer Catagint Adjust Dange	IDE	JP5 = Open	Short Range: -5 to +5 °F (-2.78 to +2.78 °C)
Room Sensor Selpoint Adjust Range	JF5	SettingJP1 = OpenJP1 = ShortedJP2 = OpenJP2 = ShortedJP3 = OpenJP3 = ShortedJP4 = OpenJP5 = OpenJP5 = ShortedJP6 = OpenJP6 = ShortedJP7 = OpenJP7 = ShortedJP7 = ShortedJP8 = OpenJP8 = OpenJP8 = Shorted	Long Range: 55 to 95 °F (12.78 to 35 °C)
Thermostat / Deem Senser	IDE	JP6 = Open	Thermostat Control
Thermostat / Room Sensor	JPO	JP6 = Shorted	Room Sensor Control
Compressor Heating Source	107	JP7 = Open	Allow Compressor Heating Mode Operation
Compressor Heating Source	JP7	JP7 = Shorted	Disable Compressor Heating Mode Operation
1/O Expansion Modula		JP8 = Open	I/O Expansion Module is Not Present
I/O Expansion Module	JP1 JP2 JP3 JP4 Aange JP5 r JP6 e JP7 JP8	JP8 = Shorted	I/O Expansion Module is Required

#### Table 12: I/O Expansion Module Configuration Jumpers for SmartSource Single and Two Stage Compressor (Series2) and SmartSource Compact

I/O Expansion Module Option	Hardware Jumpers	Setting	Description
Fan Row Selection (V6.2 & Newer)	JP1 & JP2	_	Fan row selection for the: FanOnly, Hydronic Heating, and Hydronic Cooling machine states.
		JP3 = Open	Nono
		JP4 = Open	
Secondary Heating		JP3 = Shorted	Supplemental Electric Heat
		JP4 = Open	
	JF3 & JF4	JP3 = Open	Pailerlaga Electric Haat
		JP4 = Shorted	Bolleness Electric Heat
		JP3 = Shorted	Liverania Lipsting (vG. 0. 8 Nover)
		JP4 = Shorted	
		JP5 = Open	None
		JP6 = Open	None
		JP5 = Shorted	
Cooling / Denumidification	JPD & JPO	JP6 = Open	HGR Denumidification
		JP5 = Open	
		JP6 = Shorted	Hydronic Cooling (waterside Economizer)
Not Used	JP7	JP7 = Open	_
Comprospor Consoit		JP8 = Open	Single Stage Compressor
	J70	JP8 = Shorted	Dual Stage Compressor

#### Table 13: Model Types and Options for SmartSource Single and Two Stage Compressor (Series2) and SmartSource Compact<sup>3</sup>

Model Number	Compressor Type	Supplemental Elec- tric Heat	Boilerless Electric Heat	Hydronic Heat <sup>2</sup>	HGR	Waterside Economizer
1 <sup>1</sup>	Single Stage	—	—	_	_	_
2	Single Stage	—	—	—	X	_
3	Single Stage	—	—	—	_	Х
4	Single Stage	X	—	—	_	_
5	Single Stage	X	—	—	X	—
6	Single Stage	X	—	—	—	Х
7	Single Stage	—	X	—	—	—
8	Single Stage	—	X	—	X	—
9	Single Stage	—	X	—	—	Х
10	Single Stage	—	—	X	—	—
11	Single Stage	—	—	X	X	—
12	Single Stage	—	—	X	—	Х
13	Two Stage	—	—	—	—	—
14	Two Stage	—	—	—	X	—
15	Two Stage	—	—	—	—	X
16	Two Stage	X	—	—	—	—
17	Two Stage	X	—	—	X	—
18	Two Stage	X	—	—	—	X
19	Two Stage	—	X	—	—	—
20	Two Stage	-	X	—	X	—
21	Two Stage	—	X	—	—	X
22	Two Stage	—	—	X	—	—
23	Two Stage	_	—	X	X	_
24	Two Stage	_	_	Х	_	Х

<sup>1</sup> Except for SmartSource Two Stage Compressor (Series2) WSHP with a single speed fan with no options selected, all other SmartSource Two Stage Compressor (Series2) WSHPs require both the unit controller and I/O expansion module.
 <sup>2</sup> Hydronic heating is only available for unit controller software v6.0 and newer.
 <sup>3</sup> An "X" means that option is available for the corresponding WSHP model.

#### Enfinity Large Two Compressor (SS2C)

Table 14: Unit Controller Configuration Jumpers for Enfinity Large Two Compressor (SS2C)

Unit Controller Option	Hardware Jumpers	Setting	Description
Normal / Tast Mada	104	JP1 = Open	Normal Operation
Normal / Test Mode	JPT	JP1 = Shorted	Service / Test Mode
Ean Operation	201	JP2 = Open	Continuous Fan Operation (On)
Fair Operation	JF2	JP2 = Shorted	Cycling Fan Operation (Auto)
Loop Fluid	102	JP3 = Open	Water Loop Fluid
Ecop Fluid	JEQ	JP3 = Shorted	Glycol Loop Fluid
Franza Fault Protection	ID4	JP4 = Open	LWT Freeze Fault Protection is Disabled
Freeze Fault Frotection	JF4	JP4 = Shorted	LWT Freeze Fault Protection is Enabled
Room Songer Setagint Adjust Ronge	IDE	JP5 = Open	Short Range: -5 to +5 °F (-2.78 to +2.78 °C)
Room Serborn Serborn Adjust Range	JFD	JP5 = Shorted	Long Range: 55 to 95 °F (12.78 to 35 °C)
Thermostet / Reem Senser	IDe	JP6 = Open	Thermostat Control
memostat/ Room Sensor	JFO	JP6 = Shorted	Room Sensor Control
		JP7 = Open	Path Compressors Available (Automatic Compressor Fail Banlass)
		JP8 = Open	
Compressor Availability		JP7 = Shorted	Lood Compressor Available (Log Compressor is Off Line)
	JF/ & JFO	JP8 = Open	Lead Compressor Available (Lag Compressor is On-Line)
		JP7 = Open	No Comprospere Available
		JP8 = Shorted	

Table 15: I/O Expansion Module Configuration Jumpers for Enfinity Large Two Compressor (SS2C)

I/O Expansion Module Option	Hardware Jumpers	Setting	Description	
Not Used	JP1	JP1 = Open	—	
Not Used	JP2	JP2 = Open	—	
		JP3 = Open	Nana	
		JP4 = Open	None	
		JP3 = Shorted	Supplemental Electric Liest	
Cocordon / Locting		JP4 = Open		
Secondary Heating	JP3 & JP4	JP3 = Open	Deilenlaga Electric Hast	
		JP4 = Shorted	Bolieriess Electric Heat	
		JP3 = Shorted	I hadron in 1 hadron	
		JP4 = Shorted	Hydronic Heating	
			News	
		JP6 = Open	None	
		JP5 = Shorted		
Cooling / Denumidification	JP5 & JP6	JP6 = Open	HGR Denumidification	
		JP5 = Open		
		JP6 = Shorted	Hydronic Cooling (waterside Economizer)	
Not Used	JP7	JP7 = Open	—	
Lood Comprosory Colort		JP8 = Open	Compressor #1 is Lead	
Lead Compressor Select	JP8	SettingDescriptionJP1 = OpenJP2 = OpenJP3 = OpenNoneJP4 = OpenSupplemental Electric HeatJP3 = ShortedSupplemental Electric HeatJP3 = OpenBoilerless Electric HeatJP3 = ShortedHydronic HeatingJP4 = ShortedHydronic HeatingJP5 = OpenNoneJP5 = ShortedJP5 = OpenJP5 = ShortedHGR DehumidificationJP5 = OpenHydronic Cooling (WatersicJP5 = OpenJP6 = ShortedJP5 = OpenJP7 = OpenJP6 = ShortedJP7 = OpenJP7 = OpenJP8 = OpenCompressor #1 is LeadJP8 = ShortedCompressor #2 is Lead	Compressor #2 is Lead	

#### Table 16: Model Types and Options for Enfinity Large Two Compressor (SS2C)<sup>1,2</sup>

Model Number	Supplemental Electric Heat	<b>Boilerless Electric Heat</b>	Hydronic Heating	HGR Dehumid	Waterside Economizer
1	_	—	_	_	—
2	X	—	—	—	—
3	—	Х	—	—	—
4	—	—	Х	—	—
5	—	—	—	X	—
6	X	—	—	X	—
7	—	Х	—	X	—
8	—	—	Х	X	—
9	—	—	—	—	X
10	X	—	—	—	X
11	—	Х	—	—	X

<sup>1</sup> All Enfinity Large Two Compressor (SS2C) WSHP models require both the unit controller and I/O expansion module.

<sup>2</sup> An "X" means that option is available for the corresponding WSHP model.

#### Two Speed Compressor, Multi-Fan Speed (Series1)

#### Table 17: Unit Controller Configuration Jumpers for Two Speed Compressor, Multi-Fan Speed (Series1)

Unit Controller Option	Hardware Jumpers	Setting	Description
Normal / Test Made	101	JP1 = Open	Normal Operation
Normar / Test Mode	JPT	JP1 = Shorted	Service / Test Mode
Ean Operation	IP21	JP2 = Open	Continuous Fan Operation (ON)
Fail Operation	JFZ'	JP2 = Shorted	Cycling Fan Operation (AUTO)
Loop Eluid	10.5	JP3 = Open	Water Loop Fluid
Ebop Fluid	JF3	JP3 = Shorted	Glycol Loop Fluid
Not Used	JP4	JP4 = Open	—
Room Songer Setterint Adjust Ronge	IDE	JP5 = Open	Short Range: -3 to +3 °F (-1.67 to +1.67 °C)
Room Sensor Selpoint Aujust Range	3F3	JP5 = Shorted	Long Range: 55 to 95 °F (12.78 to 35 °C)
Thermostet / Beem Senser	IDE	JP6 = Open	Thermostat Control
memostat / Room Sensor	$\begin{array}{c c c c c c c } & & & & & & & & & & & & & & & & & & &$	JP6 = Shorted	Room Sensor Control
		JP7 = Open	Single Sneed For
		JP8 = Open	
Fan Speed Selection		JP7 = Shorted	Two Speed For (Liner Scientable)
	JP7 & JP6	JP8 = Open	Two Speed Fan (Oser Selectable)
		JP7 = Open	
		JP8 = Shorted	

1JP2 setting applies only if: (1) there is a room sensor and (2) the room sensor does not have the Fan ON/AUTO switch input option wired.

#### Table 18: I/O Expansion Module Configuration Jumpers for Two Speed Compressor, Multi-Fan Speed (Series1)

I/O Expansion Module Option	Hardware Jumpers	Setting	Description		
		JP1 = Open	Single Compressor Single Stage Conseity		
		JP2 = Open	Single Compressor, Single Stage Capacity		
0		JP1 = Shorted	Single Commences Duel Stars Committee		
Compressor	JP1 & JP2	JP2 = Open	Single Compressor, Dual Stage Capacity		
		JP1 = Open	Dual Compressor Single Stage Conseity		
		JP2 = Shorted	Dual Compressor, Single Stage Capacity		
		JP3 = Open	News		
		JP4 = Open	None		
		JP3 = Shorted	Quantana antal Ela atria II.a at		
Secondary Heating		JP4 = Open			
Secondary Heating	JF3 & JF4	JP3 = Open	Pailarlass Flastria Llast		
		JP4 = Shorted	Bolieriess Electric Heat		
		JP3 = Shorted			
		JP4 = Shorted	Hydronic Heating		
		JP5 = Open	News		
		JP6 = Open	None		
Debumidification		JP5 = Shorted	LICE Debumidification		
Denumidification	JP5 & JP0	JP6 = Open	HGR Denumidification		
		JP5 = Open	Lielf Store Dehumidification		
		JP6 = Shorted	Han Stage Denumunication		
Not Used	JP7	JP7 = Open	_		
Not Used	JP8	JP8 = Open	_		

Model Number	Number of Compressors	Number of Compressor Capacity Stages	1 Speed Fan	2 Speed Fan (User)	3 Speed Fan (Auto)	Supplemental Electric Heat	Boiler-less Electric Heat	Hydronic Heat	HGR	Half Stage Cooling
1	One <sup>1</sup>	One	х	—	—	_	—	—	_	—
2	One	One	х	—	_	Х	—	—	_	_
3	One	One	Х	—	_	—	X	—	_	_
4	One	One	Х	—	_	—	—	Х	_	_
5	One	One	Х	—	_	—	—	—	Х	_
6	One	One	Х	—	_	Х	—	—	Х	_
7	One	One	Х	—	_	—	Х	—	х	_
8	One	One	—	х	—	_	—	—	_	—
9	One	One	—	Х	—	Х	—	—	_	—
10	One	One	—	Х	_	_	Х	—	_	_
11	One	One	—	Х	_	-	—	Х	_	_
12	One	One	—	х	—	—	—	—	Х	—
13	One	One	—	х	—	Х	—	—	Х	—
14	One	One	—	Х	_	_	Х	—	Х	—
15	One	One	—	—	X	—	—	—	Х	—
16	One	One	_	—	Х	Х	—	—	х	—
17	One	One	_	—	Х	-	Х	—	Х	—
18	One	Two	Х	—	_	—	—	—	_	—
19	One	Two	х	—	—	—	X	—	_	—
20	One	Two	х	—	—	—	—	Х	_	—
21	One	Two	х	—	—	—	—	—	х	_
22	One	Two	х	—	_	—	x	_	Х	-
23	One	Two	—	—	x	—	—	—	_	Х
24	One	Two	—	—	x	—	x	_	_	Х
25	One	Two	_	_	X	_		Х	_	Х
26	One	Two	—		X		X	—	Х	—
27	Two	One	X	_	_	_		_	_	_
28	Two	One	X	_	—		_	_	х	_

#### Table 19: Model Types and Options for Two Speed Compressor, Multi-Fan Speed (Series1)<sup>2</sup>

<sup>1</sup> Except for Two Speed Compressor (Series1) WSHP with no options selected, all other Two Speed Compressor (Series1) WSHP model types require both the unit controller and I/O expansion module. <sup>2</sup> An "X" means that option is available for the corresponding WSHP model.

## WSHP Unit Controller and I/O Expansion Module

The following section describes common issues and the troubleshooting steps for the unit controller with or without an I/O expansion module. Refer to the applicable OM in the Reference Documents section, available on <u>www.</u> <u>DaikinApplied.com</u>, for complete details about LED activity, faults, and additional troubleshooting topics.

### **Q:** Room Sensor LED does not come ON, or comes ON for a little while, then goes out

- A: This could be caused by incorrect voltage to the unit controller, incorrect wiring from the unit controller to the room sensor LED, defective hardware, or the unit is operating in the bypass occupancy mode.
  - Verify that the programming jumper is *tightly* installed and in the RUN position and not PRG
  - · Verify that the unit controller has 24 VAC
  - Verify that the unit is not operating in the bypass occupancy mode
  - · Verify if the unit runs/communicates when the LED is OFF
  - If it runs properly without the LED, check the LED wiring connection
  - · Download application code to the unit controller
  - Replace hardware, if necessary

## **Q:** Unit has a room sensor and is constantly in cooling mode or the space temperature consistently reads higher than actual room temperature

While the unit controller has separate connections for both return air and room temperature sensors, it is not possible for both to be used at the same time. If both sensors are connected, it causes the room temperature to read higher than the actual temperature.

A: Disconnect the return air sensor.

#### Q: Unit is experiencing nuisance high pressure trips

- A: High pressure trips can be caused by a faulty pressure switch, an improperly designed water system, or possibly a software error. High pressure switches can come loose, especially when the compressor is running. The connection could be compromised at the unit controller, a Molex connector in the middle of the switch wire, or where the wires land on the switch.
  - Contact the ATS Technical Support Team at 315-282-6434 to discuss any issues that may be related to the design of the water loop itself.
  - Verify that the high pressure switch connection to the unit controller is secured tightly to the unit controller.
  - If all the options have been explored, then the issue may be related to a condition in the Enfinity Single Stage Compressor software that creates nuisance high pressure alarms. This condition is seen approximately once every 1000+ compressor cycles.

**NOTE:** For Enfinity Single Stage Compressor units with software 2506900 (v2.6 or older) OR units with software 2506901 (v2.7 or older): update the unit controller to v3.2 or newer and I/O expansion module to v3.0 or newer.

### BACnet and LONWORKS Communication Modules

The following section describes issues and troubleshooting steps that apply to both BACnet and LONWORKS communication modules.

### **Q:** Cannot write to network setpoint or network space temp input and space temp reads 621.806 (Analog Null)

A: The unit has been set up for thermostat control.

• Use a jumper to short JP6 on the unit controller to enable room sensor control.

### **Q:** Cannot write to network setpoint input but space temp reads valid value

A: The room sensor setpoint adjustment has been enabled. For LONWORKS, set nciLocSetEnable to "Disable" or for BACnet, set MSV 14 to "1" (defaults are "Enable" and "2.")

### **Q:** Network inputting space temperature, but space temp fault indicated

- A: The Enfinity Single Stage Compressor unit controller, with software v2.8 or newer, always indicates a space temperature fault if there is an open or short on both the room sensor and the return air sensor inputs. This occurs regardless of a network input for the space temperature. In unit controller software v2.9 and newer, the network input can be used without a hardwired sensor connection.
  - Install a 10K ohm resistor on either the room sensor input or return air sensor input
  - Upgrade unit controller and I/O expansion module software to version to v2.9 or newer.

### **Q:** Unit constantly gives an Invalid Jumper Configuration alarm

- A: A Two Speed Compressor, Multi-Fan Speed (Series1) unit installed with a room sensor may experience an alarm because the software does not support this configuration.
  - Replace the unit controller software with v1.2 or newer. Refer to the General Information section to confirm current software version and compatibility among auxiliary boards, if attached.
  - Change the unit to thermostat control by shorting the JP6 configuration jumper.
    - Until the replacement thermostats arrive or a newer version of the software is installed, configure the unit to run as a single-speed compressor unit by performing the following:
  - 1. Disable two-speed compressor capacity by removing jumper JP1 on the I/O expansion module.
  - 2. Disable half-stage cooling, if applicable, by removing jumper JP6 on the I/O expansion module.

#### **BACnet Communication Module Only**

The following section applies only to the BACnet MS/TP communication module.

#### Light Emitting Diodes (LEDs)

The BACnet communication module has four LEDs that indicate the status of the module, the connection to the unit controller and/or BACnet network. These LEDs are useful for verifying communication between the unit controller and the network, as well as diagnosing a potential problem. Table 20 provides a description of the LED activity. For more details, see IM 928, available on www.DaikinApplied.com.

#### Table 20: BACnet Communication Module - LED Activity

LED	Function	Description
D1	Program Running	Program main loop activity
D2	Unit Controller Message	SPI Activity, LED on during unit controller message
D3	MS/TP Transmit	Flashes on when transmitting a MS/TP message
D4	MS/TP Receive	Flashes on when receiving a MS/TP message

#### Q: No LEDs are lit

- **A:** The communication module may not be properly installed or may not have the BACnet application software loaded.
  - Remove the communication module and then reinstall it, verifying that the connector lands on all of the pins (it is very easy to either miss just one pin or all of the pins even with the standoffs).
  - If the communication module is properly installed, try it on a different, functioning unit. If the LEDs still do not function properly, replace the communication module.
  - Re-download the BACnet software in the communication module. Contact the Controls Customer Support group at 866-462-7829 before proceeding with this option.

#### Q: All four LEDs are lit

- **A:** The BACnet application software has not been properly downloaded.
  - Re-download the BACnet software in the communication module.
  - Replace the BACnet communication module.

#### Q: Program LED (D1) never blinks

- **A:** The BACnet software is not running correctly in the communication module.
  - Re-download the BACnet software in the communication module.
  - Replace the BACnet communication module.

#### Q: SPI Comm LED (D2) never blinks

**A:** The communication module is not communicating with the unit controller.

- Verify that the programming jumper on the baseboard is in the RUN position and not the PRG position.
- Verify that unit controller is controlling the water source heat pump unit.
- · Re-download the unit controller application code.
- Re-download the BACnet software in the communication module.
- Install the communication module on a different, functioning unit to determine if the problem is associated with the unit controller or the communication module.

#### Q: RX LED (D4) never blinks

- A: The communication module is not communicating with the network.
  - Verify the BACnet MS/TP settings through the serial port on the communication module (check baud rate and any potential addressing conflicts).
  - · Verify proper network wiring.
  - Re-download the BACnet software in the communication module.
  - If the network settings are correct and the application software is functioning properly, this could indicate a hardware defect. Replace the communication module, if necessary.

#### Q: CRC errors

A: The BAS indicates "CRC errors" at the workstation.

• Upgrade the communication module to the newest version of BACnet software. It is not necessary to upgrade the unit controller or I/O expansion module software.

### **Q:** Communication module cannot be configured through serial port

- A: This could be caused by an incorrect or defective cable used to configure the communication module, software installation error, a previous change in the serial port settings, or potentially defective hardware.
  - Verify that the communication module is connected with a DB9 female-female (modem-modem) serial cross-over cable. Refer to the MicroTech III WSHP Unit Controller Protocol Document, <u>ED 15103</u>, available on <u>www.</u> <u>DaikinApplied.com</u>.
  - Confirm that the serial terminal device application settings are correct. . Refer to the MicroTech III WSHP Unit Controller Protocol Document, <u>ED 15103</u>, available on <u>www.DaikinApplied.com</u>.
  - Verify that the LED activity is normal. See Table 20.
  - Try resetting the communication module back to original default settings.
  - Re-download the BACnet software in the communication module.
  - · Replace the communication module, if necessary.

#### LONWORKS Communication Module Only

The following section applies only to the LONWORKS communication module.

The LONWORKS communication module has a Service LED that indicates the status of the module itself and the LONWORKS network. This LED is useful for verifying communication between the LONWORKS communication module and the network, and for diagnostic purposes. Table 21 provides a description of the LED activity. Refer to the LonWorks Communication Module Installation Manual, <u>IM 927</u>, available on <u>www.DaikinApplied.com</u>.

### Table 21: LonWorks Communication Module - LED Activity

LED Activity	Description
LED flashes once when power has been applied, or comes ON when pressing the Service switch	Normal operation for a commissioned LonWorks communication module
LED is OFF continuously as soon as power is applied	Faulty hardware or power supply
LED is ON continuously, even when power is first applied	Faulty hardware or power supply
LED flashes when power is applied, goes OFF, then comes ON solid	Indicates the communication module does not have the application image (APB/NXE) and interface (XIF) files properly installed - reload application files, which can be found on <u>www. DaikinApplied.com</u> or <u>www.lonmark.</u> org
LED flashes briefly once every second	The communication module could be experiencing an error with the appli- cation software or possibly the hard- ware - reload application files, which can be found on <u>www.DaikinApplied.</u> <u>com</u> or <u>www.lonmark.org</u>
LED steadily blinks ON and OFF at ½ Hz Rate (1 Sec = ON; 1 Sec = OFF)	Normal operation if the communica- tion module is decommissioned

#### Q: Service Pin LED does not light when pressed

- A: The communication module may not be installed properly, the hardware may be defective, or the LED itself may be defective.
  - Remove the communication module and then re-install it, making sure the connector snaps into place on all four of the pins. Use caution as it is easy to either miss just one pin or all of the pins, even with the standoffs.
  - Verify if the BAS recognizes the Neuron ID, even if the LED is not lit.
  - If the communication module is properly installed but no Neuron ID is broadcast, remove the communication module and install it on a different unit. If the LED does not function correctly and/or the BAS still does not recognize the Neuron ID, replace the communication module.

#### **Q:** The BAS does not "see" some or all LONWORKS Configuration Properties

- A: The communication module uses multiple User-defined Configuration Property Types (UCPTs) to pass Daikinspecific unit information to the BAS. If the BAS can access LONWORKS network variables contained in the XIF file, then it is likely that the BAS is not allowing access to these user-defined configuration properties or has not properly implemented the Resource Files giving access to the direct memory read-write CPs.
  - The controls integrator should contact his/her technical support to determine how to allow the BAS to access configuration properties.
  - The complete set of LONWORKS files required for BAS integration are available on <u>www.DaikinApplied.com</u> or <u>www.echelon.com</u> should it be necessary to reinstall them.

Factory-installed LONWORKS communication modules are loaded with all application files required for network integration.

#### Segger Flasher5 Tools

The following section summarizes common issues with Flasher tools and the corresponding solutions.

#### **Q:** The main screen does not populate with the proper Flasher information

**A:** See Figure 65. This may indicate a problem with the connection between Flasher and the computer

- Verify that the Flasher tool has power and that the Flasher serial cable is connected to the computer.
- Additionally, check that the communications port selected in the 'Communications' section of the 'Options' menu is set to the correct port (i.e. the port to which the Flasher tool is connected).

#### Figure 65: Main Screen Does Not Populate

🚺 Unti	tled - F	lasher V2	2.12a				_ [ ] ×
File Ed	dit <u>V</u> iev	v <u>T</u> arget	Options	Help			
File					Target		
No da	ita loa	ded			Device Range Interface Flasher CRC Flasher status	M38507F8FP 8000 - FFFF Serial (In Target) 0000 No communication	
Area	Adr.	L	_en.	Gap	Data (hex)		ASCII
							and a second b

#### Q: The Flasher tool's LED is red

A: Disconnect and remove power from Flasher. After a few seconds, reapply power to Flasher. Connect it to the unit controller again, verifying that the triangle on the 10-pin connector of Flasher is properly installed on the keyed connector on the unit controller's 10-pin JTAG port. See Figure 24 and Figure 24.

### **Q:** After applying power, the Target VCC field changes to a value that is too low

A: See Figure 66. This could indicate a communication error between Flasher and the unit controller. Verify that the Flasher 10-pin connector is properly connected to the keyed 10-pin JTAG connector port on the unit controller. Also verify that the unit controller is connected and powered properly. See Figure 24.

#### Figure 66: Incorrect Target VCC Value

![](_page_34_Figure_6.jpeg)

**Q:** After preparing the file to be downloaded, the Range and/or Target VCC fields appear in red

A: If the screen shown in Figure 67 appears, this indicates that the device has not been properly selected. Repeat Steps 14-17 from the Flasher downloading procedure.

<b>B</b> (2)	: yew Ia	rge: Option	e Eso				
File Hange UUUU - FFFD Rytex 78AF CRC F339 ID bytes TT FF FF FF FF FF FF FF FF FF			Tanget Device Hange Huterfaus Flueiner CRC Flueiner CRC Flueiner CRC Flueiner CRC Result Current adr Tanget VCC Rominader	Larget           Device         MT02401 CGP           Bange         EU000 - FFFFF           Interface         Starting (In Target)           Fluckher CRC         St097           Tiasher status         Flosdy           Fluckher VIn         TUL2 Volt           Fluckher Immoure         1.051 Line Fluckher HW 5.30 S/N 5237R           Result         O.K.           Current adr         —           Tagget VCC         5.01 Yoft           Bundlindere         VFTL, 3.01			
Area 0001 0002 0003 0004 0004	Adr. DDUUUUU DOFFTI4 DOFFT4 DOFFT2 DUI11A	Len. 00/099 000008 000008 000002 000002	Gap 000734 000008 000006 000006	Data [brox]         Un 32: 3C UC 3D 42: 31: 3A         FF         FF FF FF FF FF FF FF         F9         F5 C CC BC CD 23: 6E E3         F4         D2         F0         F1         H1         UU           F0         F1         UN UU         UU	AY UT I	15 41 A2 LT 20 UB	ASCH
				COMI COST	U soud	UOV1, Dataste(by	her, 19160 et 1746/17

#### Figure 67: Incorrect Range and Target VCC Fields

### **Q:** After selecting Download and Verify, a "Busy does not react" error message appears

#### A: If the message shown in Figure 68 appears:

- Verify that the Flasher5 hardware is properly connected to the unit controller.
- Verify the programming jumper is in the "PRG" position (Figure 25).
- Apply power to the unit controller and perform the download again.

#### Figure 68: Download Error Message

![](_page_34_Figure_17.jpeg)

### **Q:** After selecting Download and Verify, a "supply voltage too low" error message appears

A: If the message shown in Figure 69 appears, verify that the power supply is properly connected to the Flasher tool and that the power supply is plugged in to the power source.

#### Figure 69: Download Error Message

FLASHE	r 🔣
1	Vin < 6.0 Volt (Flasher supply voltage too low)

- **Q:** After selecting Download and Verify, an "ID mismatch" error message appears
- **A:** If the message shown in Figure 70 appears, perform the following steps:
  - 1. Verify that the passcode has been set correctly in Step 21 from the Flasher Download Procedure.
  - 2. Remove power from the unit controller.
  - 3. Apply power to the unit controller.
  - 4. Repeat the Flasher download procedure.
- **NOTE:** Replace the unit controller if this problem persists after repeating the programming process.

#### Figure 70: Download Error Message

![](_page_35_Picture_2.jpeg)

#### Segger J-Link/J-Flash ARM

The following section summarizes common issues with J-Link tools and the corresponding solutions.

#### Q: "Failed to connect" error message appears

- A: If the message shown in Figure 71 appears, follow these steps:
  - 1. Verify that the unit controller has power.
  - 2. Select Auto from the J-Flash Target tab.
  - 3. Click Yes if the message shown in Figure 72 appears.
  - 4. If the message shown in Figure 73 appears, the BACnet communication module flash memory must be manually erased by continuing to Step 5 below. If this message does not appear, proceed to the Download BACnet Communication Module Software section.
  - 5. Remove the jumper from pin 4 and pin 5 on J2 of the BACnet communication module, if connected (Figure 74).
  - 6. With power applied to the unit controller, connect the jumper between pin 5 and pin 6 on J2 of the BACnet communication module as shown in Figure 32.
  - 7. Remove power from the unit controller.
  - 8. Remove the jumper from pin 5 and 6 on J2 of the BACnet communication module, replacing the jumper on pin 4 and pin 5 of the BACnet communication module, if previously connected.
  - 9. Apply power to the unit controller. The flash memory has now been completely erased, so all configured settings return to default values.
- 10. Proceed to the Download BACnet Communication Module Software section.

#### Figure 71: Failed to Connect Error Message

![](_page_35_Picture_18.jpeg)

#### Figure 72: Relocate Message

![](_page_35_Picture_20.jpeg)

#### Figure 73: Locked Program Error Message

J-Flash	ARM V4.0BLError 🛛 🔀
1	Unable to halt ARM core Timeout while programming, core does not stop Failed to program target Failed to auto program target
	OK

#### Figure 74: Manual Erase Jumpers

![](_page_35_Picture_24.jpeg)

### Appendix: Legacy Programmers

#### Downloading to Baseboard #668105611 or I/O Expansion Module #668105711 with Renesas E2 Lite or E1 Programmer Installing the Renesas E2 Lite or E1 Programmer

The instructions below apply to downloading the WSHP unit controller or I/O expansion board using previous versions of the Renesas E1/E2 Lite programming hardware. The Renesas E1 programmer can also be used but is no longer supported. The differences are noted where necessary.

The custom interface cable assembly used with the Resesas programmer is no longer available and is referred to as the legacy cable (Figure 77).

- 1. It is assumed the user has the Renesas E2 Lite programmer and interface cable as described in Table 8.
- Download the latest Renesas Flash Programmer (RFP) software from the Renesas website at <u>www.renesas.</u> <u>com/us/en/software/D3017334.htm</u>.
- **NOTE:** It is important that you install the Flash Programming software before connecting the programmer to the USB port on your computer. The USB driver is automatically installed.
  - 3. Connect the E2 Lite programmer to the USB port on your computer using the USB interface cable.
    - a. Connect the mini-B plug of the USB interface cable to the USB I/F connector of the E2 Lite.
    - b. Connect the A plug of the USB interface cable to the USB port on your computer.
- **NOTE:** The E2 Lite is active once connected to the USB interface cable.
  - 4. Power down the unit controller.
  - 5. Connect the E2 Lite programmer to the MCU:
    - a. Connect the interface ribbon cable to the user-side connector of the E2 Lite (Figure 78).
    - b. Carefully insert the Renesas E2 Lite or E1 programmer 14-pin connector to the interface cable PCB header pins labeled "E1 Emulator" (Figure 78 and Figure 79).
    - c. Connect the 6-pin connector to the CN\_PGRM port on the control board (Figure 76).
- **NOTE:** It is important to identify the red cable wire is next to the arrow on the PCB (Figure 78). Figure 80 shows the final assembly inserted into the baseboard.
  - 6. Apply power to the unit controller.
- **NOTE:** Do not remove power from the unit controller or unplug the USB interface cable during this process. The power supplied from the board to the programmer could possibly damage the hardware.

- 7. Open the Renesas Flash Programmer (RFP) software.
- 8. Click Open Project from the File menu.
- 9. Browse to the Renesas Programmer Project file (.rpj file type) and click Open. See the Note at the end of the Getting Started section if you do not have this file.
- Click Browse in the Project File section to select the Baseboard or IO Expansion Board (.hex file type) and click Open. See the Note at the end of the Getting Started section if you do not have this file.
- If using the E1 programmer, follow steps 11a-b. Otherwise, if using the E2 Lite programmer, go to Step 12.
  - a. From the Connect Settings tab, set the Communication Tool to E1.
  - b. Click the Operation tab.
- 12. Click Start to begin programming the board. A pop-up message appears and indicates progress during the programming process.
- 13. Programming is successful when the green OK message appears.
- 14. Power down the board and disconnect the 6-pin E2 Lite interface cable from the CN\_PGRM port of the baseboard or IO expansion board.
- 15. Close the RFP software.

Programming is now complete and the board is ready for use.

### Figure 75: Renesas E2 Lite Programmer, USB Connector and Interface Cable

![](_page_36_Picture_33.jpeg)

Figure 76: MicroTech III Baseboard Programming Port

![](_page_36_Picture_35.jpeg)

Figure 77: Legacy Custom Interface Cable for Renesas E2 Lite

6-pin Connection to Baseboard or I/O Expansion Board 14-Pin Header to Renesas E2-Lite or E1 Programmer

![](_page_37_Picture_4.jpeg)

Figure 78: Legacy Renesas Programmer Attached to the 6-pin Connection Port of Interface Ribbon Cable

![](_page_37_Picture_6.jpeg)

Note the red strip on the ribbon cable is next to the small white arrow on the PCB

Figure 79: Inserting the Renesas E2 Lite Ribbon Cable to the PCB Board of the Legacy Custom Interface Cable

![](_page_37_Picture_9.jpeg)

Figure 80: Programming Hardware Fully Connected

![](_page_37_Picture_11.jpeg)

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![](_page_39_Picture_2.jpeg)

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