

M-VIEW® RTU2 3-Sled Modular IIoT Gateway

Installation Guide



FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
T4

- Protocol conversion feature converts numerous protocols simultaneously
- Modular design supports up to three communications sleds
- Advanced web server with Javascript, Bootstrap, CSS and HTML5 support delivers operations visibility anywhere
- Real-time data, event and security logging to microSD card or via FTP with cryptographic signature support
- Industrial construction for reliable operation
- Wide operating temperature range



II 3 G Ex ec IIC T4 Gc
DEMKO 20 ATEX 2268X
IECEx UL 20.0007X
UL22UKEX2576X



GENERAL DESCRIPTION

The modular 3-sled design of the MV-RTU2 allows for up to three communications sleds to be added as connectivity requirements change or new standards emerge.

Configured using FW Murphy's M-VIEW DESIGNER software or built-in web GUI, setup and configuration are seamless. The MV-RTU2 platform enables a unit to be upgraded from a powerful networking gateway with routing and VPN support to an advanced IIoT Automation Controller supporting 300+ industrial drivers.

GATEWAY PACKAGE CHECKLIST

This product package should contain the items listed below. This list does not include any sleds that may have been ordered. If any items are missing or damaged, contact FW Murphy immediately.

- DIN Rail Mount MV-RTU2 Gateway
- Pre-installed Sled Carriage
- Dust Cover
- Quick Start Guide

SAFETY SUMMARY

All safety-related regulations, local codes as well as instructions that appear in this document or on equipment must be observed to ensure personal safety and to prevent damage to either the device or equipment connected to it.

Do not use these products to replace proper safety interlocking. No software-based device (or any other solid-state device) should ever be designed to be responsible for the maintenance of personnel safety or consequential equipment not equipped with safeguards. FW Murphy disclaims any responsibility for damages, either direct or consequential, that result from the use of this equipment in a manner not consistent with these specifications.



WARNING - Explosion Hazard. Not hot swappable. do not remove or replace while circuit is live unless the area is free of ignitable concentrations.

AVERTISSEMENT - Risque d'explosion. Non échangeable à chaud. ne pas retirer ou remplacer sous tension sauf si la zone est exempte de concentrations inflammables.



CAUTION: Risk of Danger

Read complete instructions prior to installation and operation of the unit.

ATTENTION : Risque de danger

Lire les instructions complètes avant l'installation et l'utilisation de l'appareil.



WARNING - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2

AVERTISSEMENT - Danger d'explosion - Le remplacement de composants peut nuire l'aptitude à la Classe I, Division 2



This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.

Cet équipement est adapté à une utilisation dans des endroits de classe I, Division 2, Groupes A, B, C, D ou dans des endroits non dangereux seulement.

SPECIFICATIONS

1. POWER REQUIREMENTS:

The MV-RTU2 must use a Class 2 circuit according to National Electrical Code (NEC), NFPA-70 or Canadian Electrical Code (CEC), Part I, C22.1 or a Limited Power Supply (LPS) according to IEC 60950-1 or Limited-energy circuit according to IEC 61010-1.

Power connection via removable three position terminal block.

Supply Voltage: 12 to 24 VDC +/- 15%, Class 2 source

INPUT VOLTAGE	12 V	24 V
Typical Power MV-RTU2 only	4 W	4.5 W
Max Power MV-RTU2 only	4.5 W	5 W
Max Power MV-RTU2, with Sleds & USB	16 W	17 W
Max Power MV-RTU2 with full accessories	59 W	62 W

2. BATTERY: 3 V Lithium coin cell. Typical lifetime of 5 years, at nominal usage. To maintain UL rating, replacement battery must be: Rayovac BR1225X-BA or Panasonic BR1225A/BN.

3. MEMORY:

On Board User Memory: 1 GB of non-volatile Flash memory.

Memory Card: microSD slot accepts Class 5 or better microSD cards up to 256 GB capacity. FAT32, industrial grade.

4. COMMUNICATION CAPABILITIES:

USB Device Port: Isolated USB 2.0 full speed, type B connection. USB DEVICE PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

USB Host Port: Complies with Universal Serial Bus Specification Rev 2.0. Supports data transfers at high speed and full speed with over current protection (0.5 A max).

Ethernet Ports: Two 10BaseT/100BaseTX RJ-45 Ports, auto MDI/MDI-X.

Isolation from Ethernet network to Gateway: 1500 Vrms
Serial Ports: Three serial ports with individual port isolation

MV-RTU2*G	1 - RS-232 port (RJ12 connector) 2 - RS-485/422 ports (RJ45 connectors)
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5. ENVIRONMENTAL CONDITIONS:

Operating Temperature Range: -40 to 75 °C T_{AMB}

Storage Temperature Range: -40 to 85 °C T_{AMB}

Operating and Storage Humidity: 0 to 85% max. RH non-condensing

Vibration to IEC 60068-2-6: Operational 5-500 Hz, 2 g

Shock to IEC 60068-2-27: Operational 15 g

Altitude: Up to 2000 meters

Installation Category II, Pollution Degree 2 as defined in IEC/EN 60664-1.

6. CERTIFICATIONS AND COMPLIANCES:

CE Approved

EN 61326-1 Immunity to Industrial Locations

Emission CISPR 11 Class A

IEC/EN 61010-1

RoHS Compliant

ATEX Approved

II 3 G Ex ec IIC T4 Gc

DEMKO 20 ATEX 2268X

IECEX Approved

IECEX UL 20.0007X

UKEX Approved

UL22UKEX2576X

UL Hazardous: File # E317425

Rugged IP30 enclosure

ABS Type Approval for Shipboard Applications

7. CONNECTIONS:

Power Connection: Three-pin top mounted connector

Wire Strip Length: 0.3" (7.5 mm)

Wire Gauge Capacity: 12 to 24 AWG (3.31 to 0.20 mm²)
copper wire only

Torque: 4.4-5.3 inch-lbs (0.5-0.6 N-m)

Module Connection: 8 pin connectors

Wire Strip Length: 0.3" (7.5 mm)

Wire Gauge Capacity: 14 to 24 AWG (2.08 to 0.20 mm²)
copper wire only

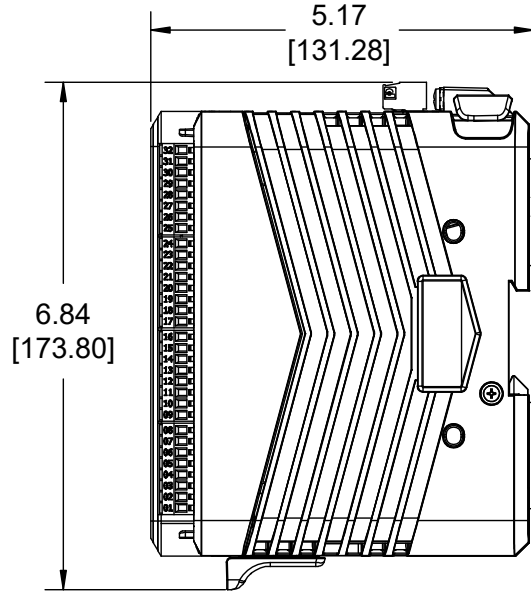
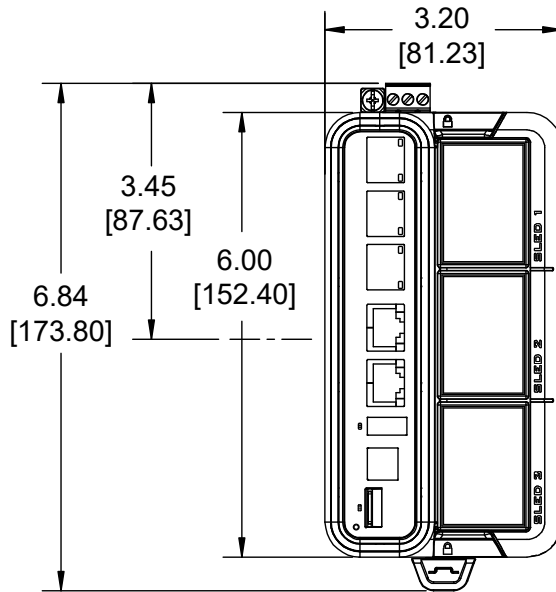
Torque: 2 inch-lbs (0.23 N-m)

8. CONSTRUCTION: Metal and plastic enclosure with IP30 rating. For use only in an approved enclosure.

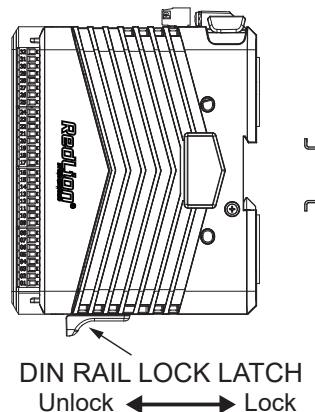
9. MOUNTING REQUIREMENTS: Mounts onto standard DIN style top hat (T) profile mounting rails according to EN50022 – 35 x 7.5 mm and 35 x 15 mm.

10. WEIGHT:

2.156 lb (978.05 g)

DIMENSIONS In Inches [mm]**INSTALLATION****Gateway DIN Rail Mounting**

The DIN rail should be mounted horizontally so that the unit's ventilation holes are vertical in relation to installation orientation. A minimum clearance of 1 inch (25.4 mm) should be maintained above and below the unit in order to ensure proper thermal regulation. A minimum 3.2 mm distance shall be maintained between the hazardous live parts of the equipment and accessible parts of the fire/electrical enclosure. For environments with vibration or impacts, DIN rail clamps are recommended.

**Recommended DIN Rail Mounting Steps:**

1. Ensure the DIN rail lock latch is in the outward most position (unlocked). Hook the top back of the MV-RTU2 DIN rail clip on the unit over the DIN rail.
2. Push the bottom of the unit towards the DIN rail until the unit is flush with the rail.
3. Push the DIN rail lock latch to the latched (in) position.

Recommended DIN Rail Removal Steps:

1. Move the DIN rail lock latch to the unlatched (out) position.
2. Unhook the top of the unit and remove it from the DIN rail.

SLED INSTALLATION

CAUTION: Follow standard ESD precautionary procedures.

ATTENTION: Suivez les procédures de précaution standard de décharge électrostatique.

1. Prior to installing the Sled(s) for your MV-RTU2 Gateway application, ensure that the Gateway is not receiving power.
2. Remove the carriage from the Gateway case by releasing the two retaining latches and pulling straight out from Gateway.
3. Remove blank panel from the carriage slot of the target sled installation location.
4. Install sled by aligning the two sled mounting hole fasteners, with the Gateway mounting posts. Be sure locating holes on bottom side of sled align with the locating pins on the carriage and the sled sits flush against the carriage.
5. Hand tighten the sled captive fasteners, or use a screwdriver if necessary.
6. Repeat the above steps for any additional sleds.

7. Carefully align the carriage with Gateway base and press carriage into the Gateway.



CAUTION: Failure to properly align the carriage can result in damage to the Sled connector pins.
ATTENTION: Si le chariot n'est pas correctement aligné, les broches du connecteur du chariot risquent d'être endommagées.

8. Close the retaining latches to ensure the carriage is fully seated into the Gateway case.

POWER SUPPLY REQUIREMENTS

The MV-RTU2 Gateway requires a 12-24 VDC power supply. Your unit may draw considerably less than the maximum rated power depending upon the configuration and features being used. As additional sleds are used, your unit will draw increasing amounts of power. Items that could cause increases in current are microSD card, communications sleds and other features programmed through software.

To ensure you do not exceed the capacity of your MV-RTU2 Gateway host power supply, calculate the total power consumption required for all planned accessories.

It is very important that the power supply meets the following requirements and is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the Gateway. Ideally, the shortest length possible should be used.
- The wire used to connect the Gateway power supply should be at least 22-gauge wire. If a longer cable run is used, a heavier gauge wire should be used. The routing of the cable should be kept away from large capacitors, inverters and other devices which may generate significant electrical noise.
- Use a power supply with an NEC Class 2 or Limited Power Source (LPS) and SELV (safety extra-low voltage) rating. This type of power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.
- Peak efficiency (MV-RTU2) occurs at the low side of the voltage range (approx. 12 V), recommended for high temperature applications.

WIRING

All power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.



CAUTION: Only UL listed wiring with temperature ratings greater than 90 °C permitted for Class I, Division 2, Zone 2 and ATEX, IECex and UKEX installations.
ATTENTION: Seul le câblage homologué UL avec des températures nominales supérieures à 90°C est autorisé pour les installations de classe I, Division 2, zone 2 et ATEX, IECex et UKEX.

CONNECTING TO EARTH GROUND

Each MV-RTU2 has a chassis ground terminal on the top of the unit. Your unit should be connected to earth ground. Steps should be taken beyond connecting to earth ground to eliminate the buildup of electrostatic charges.

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal

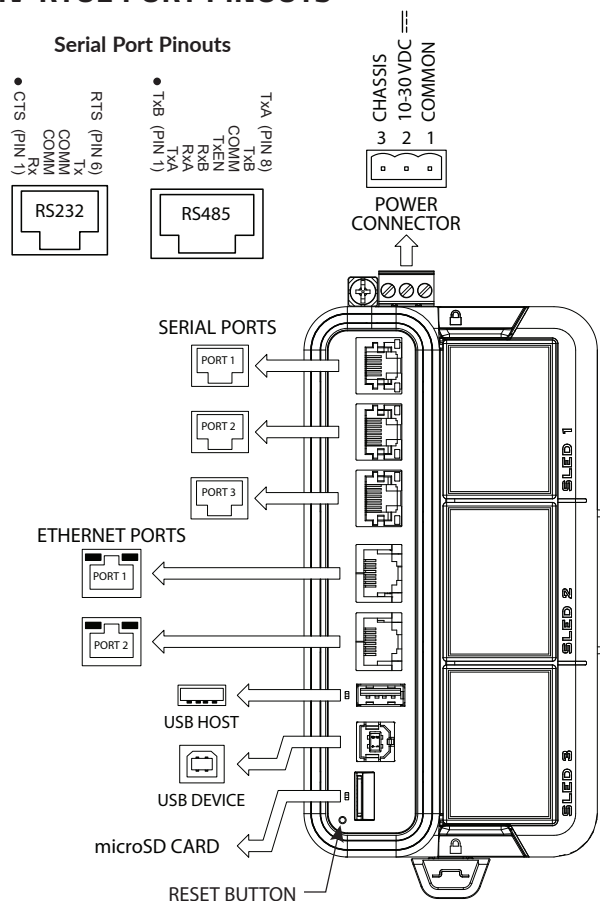
common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit. For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.¹

¹ USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

FACTORY RESET BUTTON

The factory reset button located in the lower left area of the front of the unit can be used to clear the configuration. Hold in the reset button at power up until the status ring LED turns bright white. Click the button to cycle through colors on the status ring LED. If left at white, the unit will boot its existing configuration, and if left at red it will clear the units memory. Once the memory is cleared, the user will need to use the default password printed on the unit to access the configuration.

MV-RTU2 PORT PINOUTS



CONFIGURING A MV-RTU2

The MV-RTU2 can be configured using M-VIEW DESIGNER 3.2 software. M-VIEW DESIGNER is available as a no-charge download from FW Murphy's website. M-VIEW DESIGNER updates for new features and drivers are posted on the website as they become available. By configuring the MV-RTU2 using the latest M-VIEW DESIGNER version, you are assured that your unit has the most up-to-date feature set. M-VIEW DESIGNER software can configure the MV-RTU2 via a TCP/IP programming link or via USB Serial Device port or TCP/IP interface (192.168.241.241) exposed when connected to the USB Device Port.

The microSD card can be used to program a MV-RTU2 by placing an image file on the microSD card. The card is then inserted into the target MV-RTU2 and powered. Refer to the M-VIEW DESIGNER 3.2 Software Guide for more information on the proper names and locations of this file.

MV-RTU2 Web User Interface

1. Connect a PC to the MV-RTU2 Gateway using an Ethernet cable to Ethernet port 2 on the Gateway.
2. Set up the PC IP address by filling in the blank fields with the information below:

Ethernet	Port
IP Address	192.168.222.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.222.1
Preferred DNS	192.168.222.1

3. Open a web browser and enter the following in the address bar: <https://192.168.222.222>

4. To log in to the System webserver for the first time:

User Name: admin

Password: Refer to unique password located on unit.

Note: For security, it is recommended to change the password according to your company's internal policy. To change the password, go to Administrator → Change Password.

Ethernet Communications

Ethernet communications can be established at either 10Base T or 100Base TX. The MV-RTU2's RJ45 jacks are wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC, use a crossover cable. Refer to the M-VIEW DESIGNER 3.2 Software Guide and FW Murphy's website for additional information on Ethernet communications.

LED COLOR(S)	MEANING
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN (OFF)	10 BASE-T Communications
GREEN (ON)	100 BASE-TX Communications

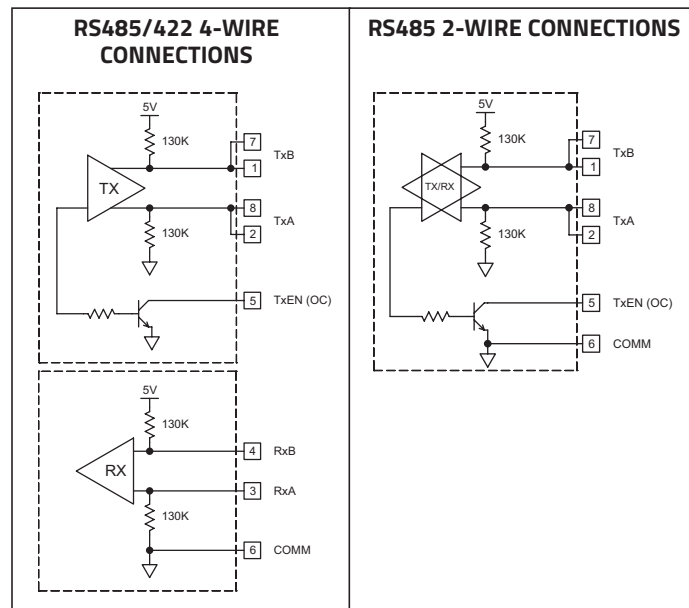
RS232 PORT(S)

The MV-RTU2 has one serial port that can be used for either programming or communications. The RS232 port can be used for Client or Server protocols. The serial port has a pair of LEDs to indicate transmit and receive activity. The pinout is shown to the right.

MV-RTU2 RS232 to a PC			
MV-RTU2 : RJ12		PC : DB9	
Pin #	Name	Pin #	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COMM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI

RS485/422 COMMS PORT(S)

The MV-RTU2 has one or two RS485 ports depending on unit configuration. These ports can be used for RS485 or RS422 communication. The comms port has a pair of LEDs to indicate transmit and receive activity.



Note: All FW Murphy devices connect A to A and B to B. Refer to www.fwmurphy.com for additional information.

Examples of RS485 2-Wire Connections

MV-RTU2 to FW Murphy RJ11			
MV-RTU2 : RJ45		FW Murphy : RJ11	
Pin #	Name	Pin #	Name
5	TxEN	2	TxEN
6	COMM	3	COMM
1	TxB	5	B-
2	TxA	4	A+

DH485 COMMUNICATIONS

The MV-RTU2's RS485/422 COMMS port can also be used for Allen-Bradley DH485 communications.

WARNING: DO NOT use a standard DH485 cable to connect this port to Allen-Bradley equipment.

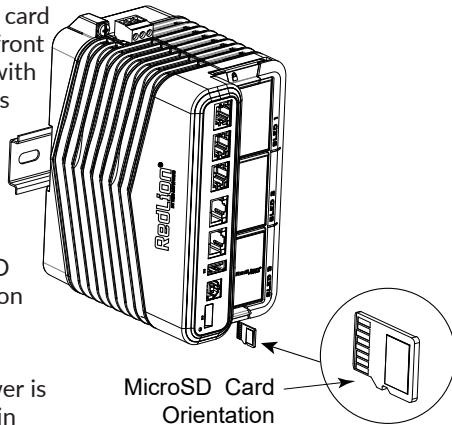
STATUS RING LED

LED COLOR/STATE	MEANING
Pulsating white	PXE starting up
Steady dim white	PXE running with M-VIEW DESIGNER stopped
Steady pale green	PXE running with M-VIEW DESIGNER running
Steady pale red	Accepted alarms present
Pulsating red	Active Alarms present
Pulsating red and green	Identify command received
Flashing red and white	MVD 3.2 crashed and restarting

INSTALL THE microSD CARD

Insert the microSD card into the slot on the front of the Controller with the card oriented as shown. The card is inserted properly when the card clicks into place in the card holder. To remove the microSD card, push in slightly on the card.

Note: Removal of the microSD while power is applied may result in corruption or loss of data.



MV-RTU2 GATEWAY BATTERY & TIME KEEPING



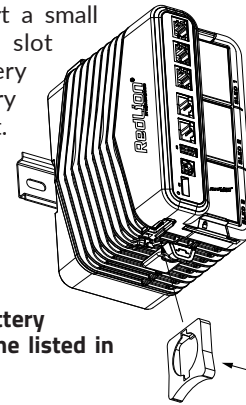
WARNING - Explosion Hazard - The area must be known to be non-hazardous before servicing/ replacing the unit and before installing or removing I/O wiring and battery. Not hot swappable.

AVERTISSEMENT - Risque d'explosion - La zone doit être considérée comme non dangereuse avant de procéder à l'entretien ou au remplacement de l'appareil et avant d'installer ou de retirer le câblage E/S et la batterie. Pas échangeable à chaud.

A battery is used to keep time when the unit is without power. The battery of a MV-RTU2 Gateway unit does not affect the unit's memory. All configurations and data are stored in non-volatile memory.

Changing the Battery

To change the battery of a MV-RTU2 Gateway, first remove power to the unit. Insert a small screwdriver into the slot provided on the battery holder and pry the battery holder out of the unit. Remove the old battery from the holder and replace it with a new battery.



To maintain UL rating, battery must be replaced with one listed in the Specifications.

Note: Battery orientation MUST MATCH as shown.



CAUTION: Lithium battery. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

ATTENTION: Pile au lithium. Danger d'explosion si la batterie est mal remplacée. Remplacez-la uniquement par une pile du même type ou d'un type équivalent recommandé par le fabricant.



Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. The battery must not be disposed of in fire or in a manner whereby it may be damaged and its contents could come into contact with human skin.

Veuillez noter que la vieille pile doit être éliminée conformément à la réglementation locale en matière de déchets. La pile ne doit pas être jetée au feu ni d'une manière qui pourrait l'endommager et son contenu pourrait entrer en contact avec la peau humaine.

ORDERING INFORMATION

SOFTWARE GROUPS	
	Group 3 IIoT
Configuration	
Web GUI	Y
M-VIEW DESIGNER	Y
Networking	
Firewall	Y
RADIUS Auth.	Y
Routing	Y
NAT	Y
IP Fallback	Y
VPN Client/Server	Y
Automation	
300+ Drivers	Y
IIoT Connectors	Y
OPC UA	Y
SQL Sync	Y
Data Logging	Y
Virtual HMI	Y
Advanced Web Server	Y

Main Unit

PART NUMBER	SW GROUP	DESCRIPTION
50705669	Group 3	3-Sled 1 RS232 port and 2 RS485 ports Adv IIoT Gateway

Accessories

PART NUMBER	DESCRIPTION
DAS00PN1EE200000	Dual Ethernet Sled
DAS00PN2221IS000	Dual RS232 Ports Sled (Isolated)
DAS00PN2442IS000	Dual RS485 Ports Sled (Isolated)
DAS00PN2245IS000	Mixed RS232/RS485 Ports Sled (Isolated)
DAS00PN8CA6IS000	DA Series, CAN Protocol Interface Sled
DAS00PN8J16IS000	DA Series, J1939 Protocol Interface Sled
DAS00WF10N0AM000	802.11n Wi-Fi Sled

A listing of the entire family of products and accessories can be found at www.fwmurphy.com.

FW MURPHY TECHNICAL SUPPORT

If for any reason you have trouble operating, connecting or simply have questions concerning your new product, contact FW Murphy's technical support.

Phone: (918) 957-1000

Email: FWM-TechSupport@doverprecision.com

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