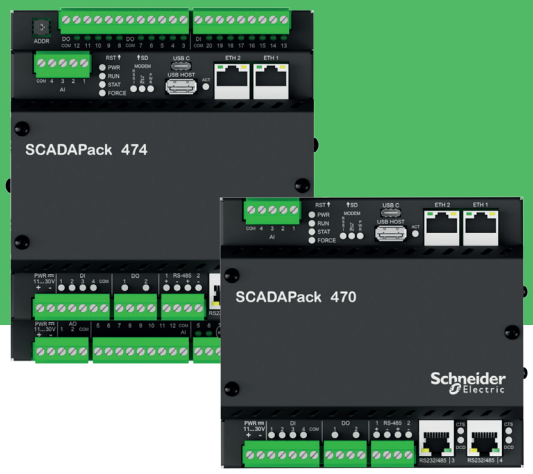
Green Premium™

Life Is On Schneider Electric

SCADAPack 470 | 474

Remote Programmable Smart RTUs



Product at a glance

SCADAPack™ x70 is the latest generation of SCADAPack Smart RTUs. Optimized for remote operations, the SCADAPack 470 and 474 Smart RTUs are the newest models to be introduced in this new series.

Simple: SCADAPack RemoteConnect configuration software facilitates configuration, logic development, data logging, and diagnostics in a single application, helping to reduce costs and overhead associated with maintaining multiple software applications for managing a single device. The SCADAPack 47x has ready-to-use Realflo™ Oil and Gas Flow Computer and Realift™ artificial lift solutions.

Efficient: The SCADAPack x70 Logic Editor within RemoteConnect software is based on EcoStruxure™ Control Expert software components, allowing for code reuse and sharing between Schneider Electric Modicon™ PLCs and SCADAPack Smart RTUs.

Rugged: Designed with Cybersecurity and ruggedized communications in mind, SCADAPack 47x hardware features conformal-coated boards and wide operating temperatures of -40...70 °C (-40...158 °F). Class I, Div. 2 and Zone 2 hazardous area certifications are included.

Green Premium™ ecolabel product – Sustainable performance, by design

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Product Highlights:

Flexible Protocol Implementation

- Open standard telemetry protocols such as DNP3 level 4 with Security Suite (Secure Authentication) and IEC 60870-5-104
- Easily associate Modbus™ and DNP3 protocols to database objects and variables
- DNP3 routing and Modbus Store and Forward facilitate communications bridge functionality using either protocol

Tagged (named) Object Database

- Improved readability and debugging of configuration and logic
- Easy-to-use object data logging

Microsoft® Excel Export and Import of Database Objects

- Create external templates for reuse and manipulation of configurations
- Reduce engineering time and costs for large systems with common configurations

SCADAPack x70 Logic Editor

- Based on EcoStruxure Control Expert (Unity Pro) software components with 5-language support for IEC 61131-3
- Code segment and function block export and import for code sharing between Schneider Electric Modicon PLCs and SCADAPack RTUs
- Leverage experience and personnel training across remote (RTU) and in-plant (PLC) projects

Remote Maintenance

- Update firmware, load/update logic, load configurations, and view diagnostics remotely or locally with RemoteConnect software
- Manage and configure multiple devices such as HART® instruments, actuators, variable frequency drives (VFDs), and other devices using plug-in DTMs for FDT2 or FDT1.2 within RemoteConnect software

Remote Ready Hardware

- 12...24 Vdc Input Power with input voltage monitor
- Wide operating temperature -40…70 °C (-40...158 °F)
- Conformal-coated circuit boards

Typical applications for SCADAPack 470/474 RTUs

Oil and Gas:

- Tank monitoring and automation
- Well test automation
- Well production and optimization
- Measurement

Water and Wastewater

- Leakage detection
- Equipment monitoring and control
- Water quality monitoring
- Irrigation
- DMAs (District Metering Areas), PMAs (Press. Monitoring Areas)
- Monitoring flow / level / pressure and temperature, etc.

and many others...

Solution Ready

- Available Realflo Oil and Gas flow computer
- Available Realift artificial lift control system

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Configuring and programming SCADAPack 47x RTUs

RemoteConnect software

RemoteConnect software facilitates configuration, diagnostics, logic development, and device management:

- Locally through any of the communication ports (default: USB device port)
- Remotely through serial or TCP/IP networks and modems

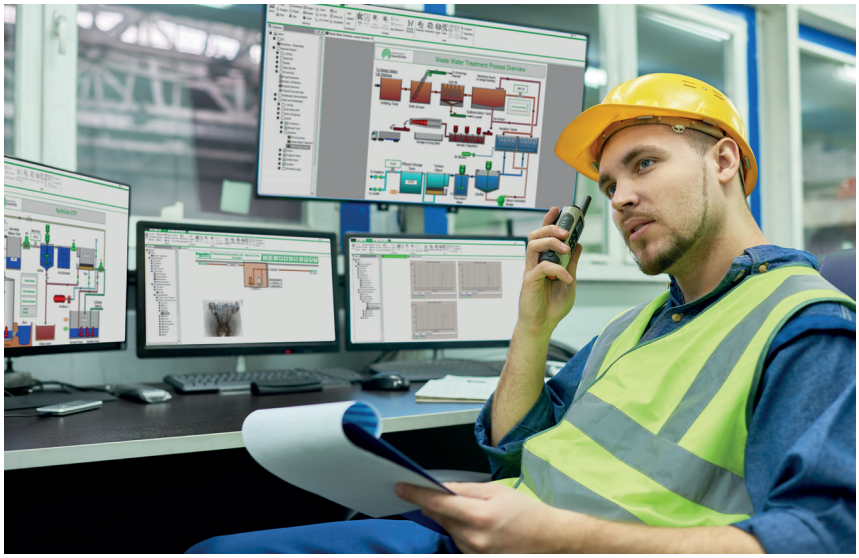
Device Management

- Upgrade of SCADAPack firmware
- Upgrade of I/O expansion module firmware[1]
- HART device configuration and data monitoring via vendor-supplied plug-in DTMs[2]
- Asset Management Software (AMS) TCP/IP network access to HART instruments and actuators via HART pass-through

Logic Development

RemoteConnect includes the SCADAPack x70 Logic Editor with which users can:

- Choose from five IEC 61131-3 compliant languages
- Use compiled run-time code for fast execution
- Import and export logic code segments for use in other SCADAPack projects or sharing[3] with Modicon PLC projects
- Perform online debugging and logic modifications from the SCADAPack x70 Logic Editor
- Develop and write logic to a running system without interruption to the logic
- Deploy new logic code between scans with minimal effect on execution time
- Using the EFB Toolkit, C programming can be used to create custom functions and function blocks



Configuration

- Use descriptive naming of objects to enhance development, debugging, and translation to host systems
- Import or export configurations for templating and bulk editing externally in Excel
- Group, filter, and sort objects for easy editing and viewing with RemoteConnect software object browsers

Datalogging

- RemoteConnect includes the SCADAPack x70 data logger. This feature can be used to provide a detailed record of a remote asset when investigating its operation remotely or on site.
- Use the RemoteConnect object browser to configure database objects for periodic or event-driven data logging.
- RemoteConnect's visualization tool can be used to display logged data when connected to the SCADAPack.
- Store up to 1,000,000[4] event records using internal memory and over 100,000,000 records using a USB drive or MicroSD card.

Diagnostics

- View system information and status from object browsers within RemoteConnect software
- View advanced diagnostics using the Telnet command line interface, including built-in protocol analyzers for DNP3, IEC 60870-5-104 and Modbus

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Specifications

Architecture

Processor	Dual ARM® Cortex® A7, plus ARM Cortex M3; 500 Mhz
Memory	• SRAM – 4 MB, battery backed static RAM • DDR3 RAM – 256 MB, dynamic RAM • NAND Flash – 256 MB, flash memory
Events and datalogging	• DNP3 and IEC 60870-5-104 events: 40,000[5], store up to 1,000,000 events using internal file system • Store up to 100,000,000 events using USB drive or MicroSD card

Database capacity	• Maximum number of database objects: Typically 15,000
	• Maximum number of database objects linked with logic programming: Typically 6,000
	• Object memory:
	  • Typical 2,600,000 bytes (event buffer at 5000 events)
	  • Maximum: 2,756,800 bytes (event buffer at 100 events)
	  • Minimum: 1,480,000 bytes (event buffer at 40,000 events)

Maximum DNP3 Outstation devices[5]	Approximately 90
Maximum DNP3 Outstation objects[5]	Approximately 15,000[6] across DNP3 Outstation devices
Maximum Modbus Server Devices[7]	150
Maximum objects mapped from Modbus devices	3,000[6]
File system storage	Approximately 70 MB
USB host storage	• Single-partition plug-in USB mass storage devices up to 32 GB[8] • File format: FAT32
MicroSD card	Up to 32 GB formatted with the FAT32 file system. MicroSD cards larger than 32 GB can be used by preparing a 32 GB volume on the card.

Communications

Serial Ports: 1, 2	RS-485: 2-wire half-duplex operation. 4-pin removable terminal block, maximum baud rate 115,200 bps.
Serial Ports: 3, 4	• RS-232: TxD, RxD, CTS, RTS, DCD, DTR • RS-485: 2-wire half-duplex operation • 8-pin modular RJ45 jack, maximum baud rate 115,200 bps
Serial Port: 5	• RS-232: TxD, RxD, CTS, RTS, DCD, DTR • Switched power out for modem, 350 mA available at RTU inputs voltage 12...24 Vdc, 8-pin removable terminal block under top cover.
Serial Protocols	DNP3 level 4 outstation/client and peer-to-peer, Modbus RTU server/client
Ethernet Ports: Eth1, Eth2	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100 Base-T), transformer-isolated, switched or independent ports
IP Protocols	• DNP3 level 4 in TCP or in UDP Controlling Station/Outstation and peer-to-peer, • Modbus/TCP Server, Modbus/TCP Client • IEC 60870-5-104 controlled station • Telnet Server, FTP Server
USB Device Port	• USB 2.0-compliant C-type receptacle • Supports communications at 1.5 Mb/s and 12 Mb/s
USB Host Port	• USB 2.0-compliant A-type receptacle • Supports USB mass storage devices up to 32 GB • Supports communications at 1.5 Mb/s and 12 Mb/s

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Specifications – cont'd

General

Logic Control	RemoteConnect software (SCADAPack x70 Logic with five IEC 61131-3 languages)
I/O Terminations	3.3...0.08 mm^2 (12...28 AWG), solid or stranded
Dimensions	• SCADAPack 470: 142 mm W x 127 mm H x 67 mm D (5.59 in. x 5.00 in. x 2.64 in.) • SCADAPack 474: 142 mm W x 166 mm H x 88 mm D (5.59 in. x 6.54 in. x 3.46 in.)
Packaging	• Corrosion-resistant; zinc-plated steel base and stainless steel cover with black enamel paint • G3 conformal-coated circuit boards
Environment	• -40…70 °C (-40…158 °F) operating temperature when the unit is mounted horizontally on a vertical surface • -40…65 °C (-40…149 °F) operating temperature when the unit is mounted in any other position • -40…85 °C (-40…185 °F) storage temperature • 5...95% relative humidity, non-condensing • Pollution Degree 2, Installation Category I, Indoor use
Shock	IEC 61131-2 ½ sine, 15 ms, 15 g
Vibration	• IEC 61131-2 • 5...8.4 Hz: Amplitude controlled, 7.0 mm (0.28 in) peak-to-peak • 8.4...150 Hz: Acceleration controlled, 1.0 g peak

Power Supply

Input voltage	• Rated Voltage 14…29 Vdc • Turn-on 10…11.5 Vdc • Turn-off 9…10 Vdc
Power requirements	• 2.8 W (SCADAPack 470) • 4 W (SCADAPack 474)
Maximum power input to controller (excluding modem)	8.4 W

Certifications

Industrial Standards	Requirements specific to the SCADAPack functional characteristics, immunity, robustness, and safety: • IEC/EN 61131-2 • CAN/CSA 22.2 No. 61010-1-12 and CAN/CSA 22.2 No. 61010-2-201 • UL 61010-1 and UL 61010-2-201
CE Marking Compliance	• For the latest information regarding product compliance with European Directives for CE marking, refer to the EU Declaration of Conformity issued for your product at se.com • For the latest information regarding product environmental compliance visit the Schneider Electric Check a Product portal at https://checkaproduct.se.com/
Installation in Classified Ex Area	• North America: Hazardous locations Class I, Division 2, groups A, B, C, and D, T4 and Class I, Zone 2, T4, -40 °C ≤ Tamb ≤ 70 °C (-40 °F ≤ Tamb ≤ 158 °F) according to CSA C22.2 No. 213-17, UL 12.12.01 • ATEX: EU Directive 2014/34/EU in defined atmosphere Zone 2 ATEX II 3G, Ex ec nC IIC T4 Gc according to EN IEC 60079- 0, EN IEC 60079-7 and EN IEC 60079-15 • For Eurasian Economic Union: EAC
Specific Countries	• For Australia and New Zealand: ACMA requirements for RCM marking • For United States: FCC Part 15 Subpart B Class A

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Specifications – cont'd

Digital and Analog Inputs/Outputs

SCADAPack Smart RTU	Digital inputs 12...24 Vdc		Digital outputs		Pulse counter inputs (shared with DIs)		Analog inputs		Analog outputs
	DI 1...4	DI 5...20	DO 1...2	DO 3...12	DI 1...4	DI 5...12	AI 1...4	AI 5...12	AO 1...2
470	4	-	2	-	4	-	4	-	-
474	4	16	2	10	4	8	4	8	2

Digital Inputs	**DI 1...4** 12…24 Vdc **DI 5...20** (SCADAPack 474 only) 12…24 Vdc
Pulse Counter Inputs	**DI 1...4** Max. 10 kHz (@ 50% duty cycle) Built-in turbine preamplifier[10] for direct connection to turbine coils using short, shielded cable only. **Shared with first 8 digital input channels on lower I/O board** **DI 5...8 (SCADAPack 474 only)** Max. 1.5 kHz (@ 50% duty cycle) **DI 9...12 (SCADAPack 474 only)** Max. 150 Hz (@ 50% duty cycle)
Digital Outputs	**DO 1...2** Form A, NO (Normally Open) relays, 2 A @ 30 Vdc, **DO 3...12 (SCADAPack 474 only)** Form A, NO (Normally Open) relays, 2 A @ 30 Vdc
Analog Inputs	**AI 1...4** 0…20 mA, 4…20 mA, 0…5 Vdc, 1…5 Vdc, 12-bit resolution, unipolar, non-isolated, voltage/current selectable by software, configurable for 30 mSec high speed update rate **AI 5...12 (SCADAPack 474 only)** 0…20 mA, 4…20 mA, 0…5 Vdc, 1…5 Vdc, 24-bit resolution, single-ended, isolated from logic and chassis. Filtering configuration 'none' results in fast sampling @100 mSec total for all 8 channels, '50/60Hz' filter configuration results in sampling @ 500mSec for all 8 channels
Analog Outputs	**AO 1...2 (SCADAPack 474 only)** 0…20 mA, 4…20 mA (voltage output with external resistor), 12-bit resolution over 0…20 mA range, single-ended, isolated from logic and chassis
Internal (System) Analog Inputs	• Input power supply voltage monitor, 36 Vdc full scale • Memory/RTC battery voltage monitor • Internal temperature monitor, measurement range -40…75 °C (-40...167 °F)
Clock calendar	±15 seconds per month at -40…70 °C (-40...158 °F)

Additional I/O

Supported Modules	• Supported modules: 5304, 5405, 5410, 5414, 5415, 5505, 5506, 5606, 5607, 6601, 6602, 6607 • When SCADAPack 47x controller is used with 5000-series I/O Expansion modules, order one Inter Module Cable (IMC) adaptor cable (ref. TBUM297138), to adapt from 20 signal lines (used by SCADAPack x70 Smart RTUs) to 16 signal lines (used by 5000-series IO modules) • Maximum number of external expansion modules per unit: 15
I/O Expansion Limits[9]	• Refer to the SCADAPack x70 Documentation Set > Hardware Manuals for further details. • Maximum intermodule cable length (not including the short cables that come with each module) is 1.82 m (75 in.)

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Model Code

TBUP474UA50BB00S is an example of a SCADAPack 474 part number using the model codes below

Code	Select: Hardware platform
TBUP470U	SCADAPack 470, 32-bit controller, Dual Core, SCADAPack x70 Firmware (RemoteConnect Configuration & IEC 61131-3 programming software, included)
TBUP474U	SCADAPack 474, 32-bit controller, Dual Core comes with additional I/O, SCADAPack x70 Firmware (RemoteConnect Configuration & IEC 61131-3 programming software, included)

Code	Select: SCADA Security
A	Standard security features, includes DNP3 Secure Authentication SAv2 (Security Administrator application required)

Code	Select: Protocol Option
5	DNP3 Serial/IP client/outstation/peer-to-peer, Modbus RTU/TCP client/server, TCP/IP, and IEC 60870-5-104

Code	Select: License Option
0	Standard DNP3 features, includes DNP3 Data Concentrator Controlling Station License

Code	Select: Analog & Digital Inputs/Outputs
AA	SCADAPack 470: • 4 Analog Inputs, selectable as 0…20 mA, 4…20 mA, 0…5 Vdc, 1…5 Vdc • 4 Digital Inputs (12...24 Vdc) • 2 Digital Outputs Form A, NO (Normally Open) relays
BB	SCADAPack 474, adds: • 8 Analog Inputs, factory-shipped selectable as 0…20 mA, 4…20 mA, 0…5 Vdc, 1…5 Vdc • 2 Analog Outputs, selectable as 0...20 or 4...20 mA • 16 Digital Inputs (12...24 Vdc) • 10 Digital Outputs Form A NO (Normally Open) relays

Code	Future Option
0	None

Code	Select: Realflo Flow Computer - Flow Run License Options
0	None
3	3 Runs - any combination of gas, liquid or water totaling 3 runs (gas runs include gas transmission option)
6	6 Runs - any combination of gas, liquid or water totaling 6 runs (gas runs include gas transmission option)
T	12 Runs - any combination of gas, liquid or water totaling 12 runs (gas runs include gas transmission option)
V	20 Runs - any combination of gas, liquid or water totaling 20 runs (gas runs include gas transmission option)

Code	Select: Certifications
S	• FCC 47 CFR Part 15, Subpart B; ICES-003; CE and RCM markings, cULus Hazardous Location Class I, Division 2, Groups A, B, C and D, T4; and Class I, Zone 2, IIC • ATEX: EU Directive 2014/34/EU) in defined atmosphere Zone 2 ATEX II 3G, Ex ec nC IIC T4 Gc according to EN IEC 60079- 0, EN IEC 60079-7 and EN IEC 60079-15 • For Eurasian Economic Union: EAC

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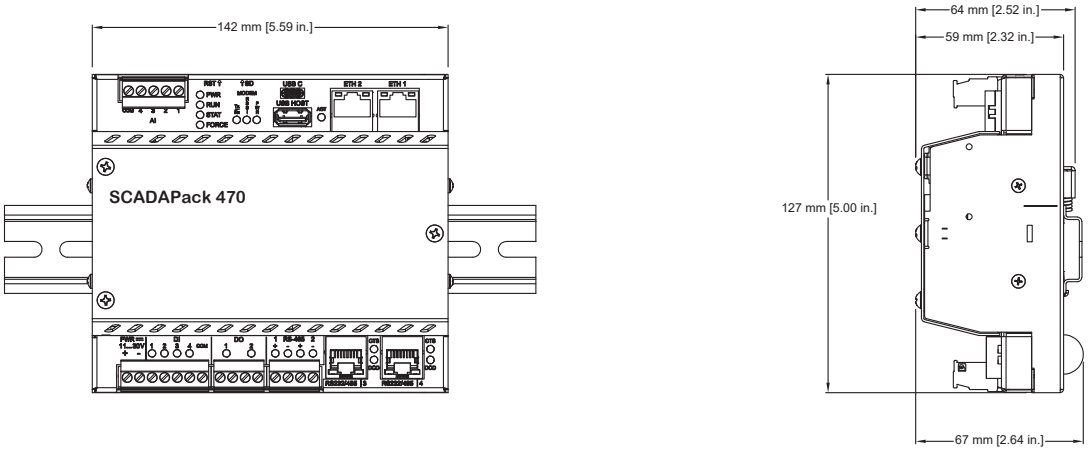
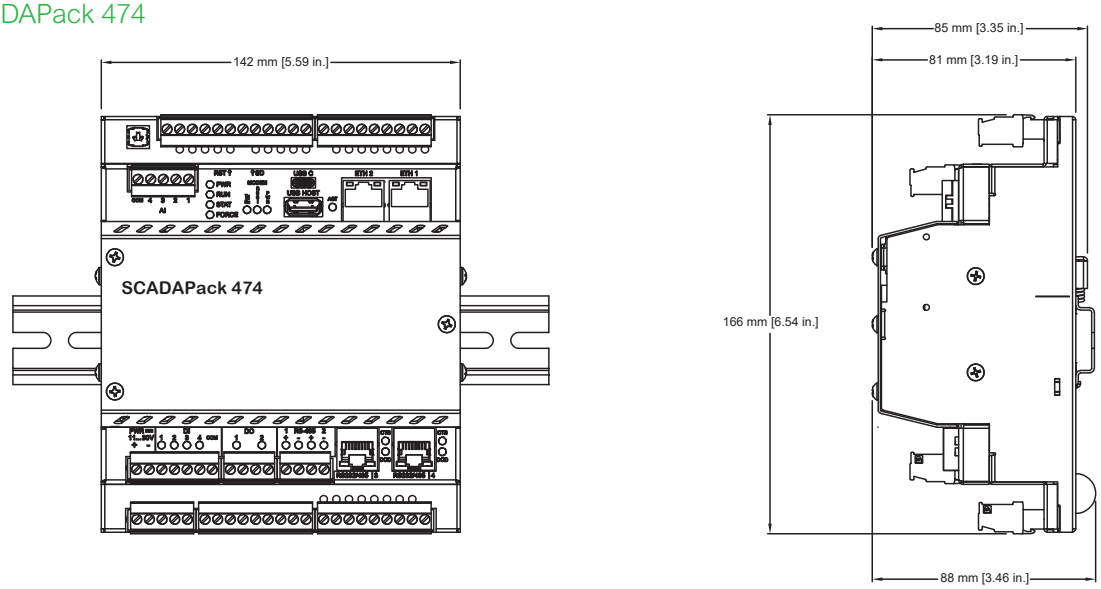
Accessories

Part Number	Description
TBUM297310	SCADAPack 47x Connector Kit - five complete sets of spare connectors for SCADAPack 470 and 474 RTUs, and 6607 I/O expansion module
TBUM297147	SCADAPack Rod Pump Controller, Factory
TBUM297148	SCADAPack Rod Pump Controller, Field Upgrade

Dimensions - SCADAPack 470



Dimensions - SCADAPack 474



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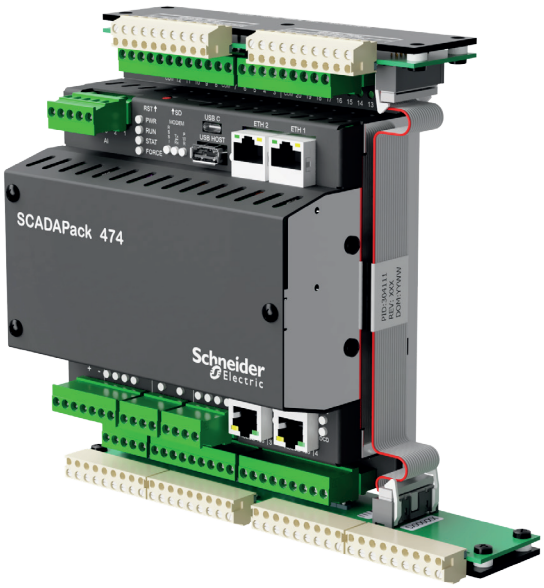
Terminal Adaptors



Optional terminal adaptors provide the possibility for drop-in wiring replacement of existing SCADAPack P1, or SCADAPack P4 RTUs. This approach can save substantial time and costs when upgrading existing panels to SCADAPack 474.

The terminal adaptors provide pin headers that accept the older style 'gray' plug-in terminal blocks. The adaptors position the terminal headers to approximately the same physical position as they are on the existing SCADAPacks. If panel space allows, and the wiring scheme is compatible with the terminal adaptors, the SCADAPack 474 can be placed into the existing panel, and existing wiring to the lower I/O board can be plugged onto the terminal adaptors without removing the wires from the terminal blocks.

For further details on the TBUM297915 terminal adaptor kit, refer to its data sheet (TBULM08038-10).

1. I/O expansion module firmware upgrades are supported on 6xxx modules only.
2. DTM is Device Type Manager – vendor-supplied device driver for device-specific configuration and data display. RemoteConnect software is an FDT1.2 (Field Device Tool version 1.2) and FDT2 (Field Device Tool version 2) container for compatible DTMs.
3. Sharing of logic code does not include hardware specific functions or system variables that are not common to both platforms.
4. Internal memory can be configured to limit internal event storage. External events are stored on a device formatted to 32 GB.
5. Polled by the SCADAPack when it is operating as a DNP3 Controlling Station
6. Varies depending on object types, event storage, and integrated application memory usage.
7. Refer to product manual for details as actual maximum number of Modbus server devices depends on polling method(s) and port type (serial or Ethernet).
8. Larger USB mass storage devices may be formatted to 32 GB FAT32.
9. Additional power supply modules (model 5103 or 6103) may be required for additional bus power, depending on how many expansion modules are included on the bus.
10. Turbine preamplifier supported on DI1 and DI2 only.

Note: Refer to the SCADAPack x70 Documentation Set for further details.

Disclaimer:
The information provided in this document contains general descriptions and/or technical characteristics of the performance of the described products or services. For detailed specification, performance and instruction of use, refer to corresponding Catalogs and user guides if available.

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Part Number: TBULM08030-05 v34

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Green Premium™

Schneider Electric's commitment to deliver products with best-in-class environmental performance.

Green Premium™

More than 75% of our product sales offer superior transparency on the material content, regulatory information and environmental impact of our products:

- RoHS compliance
- REACH substance information
- Industry leading # of PEP's*
- Circularity instructions

Learn more about Green Premium

Green Premium promises compliance with the latest regulations, transparency on environmental impacts as well as circular and low-CO_2 products.

CO2 and P&L impact through… Resource Performance

Green Premium brings improved resource efficiency throughout an asset's lifecycle. This includes efficient use of energy and natural resources, along with the minimization of CO_2 emissions.

Cost of ownership optimization through… Circular Performance

We're helping our customers optimize the total cost of ownership of their assets. To do this, we provide IoT-enabled solutions, as well as upgrade, repair, retrofit, and remanufacture services.

Peace of mind through… Well-being Performance

Green Premium products are RoHS and REACH-compliant. We're going beyond regulatory compliance with step-by-step substitution of certain materials and substances from our products.

Improved sales through… Differentiation

Green Premium delivers strong value propositions through third-party labels and services. By collaborating with third-party organizations we can support our customers in meeting their sustainability goals such as green building certifications.

*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)