Compact and Versatile Controller for SCADA & Telemetry Solutions

SCADAPack Smart RTUs and I/O Expansion Modules

Unique Features

SCADAPack™ Smart RTUs combine the monitoring and communications capabilities of remote terminal units (RTU) with the processing and data-logging power of programmable logic controllers (PLC), providing superior functionality wherever remote processes require automatic supervision and autonomous control.

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Enhanced performance in oil/gas and water/wastewater applications

SCADAPack Smart RTUs are the foundation for a range of solutions offering specific software and configuration tools tailored to your needs in:

Digital Oil Field Solutions:

- Electronic Flow Measurement

Water/Wastewater Solutions:

- Optimised for Remote Pumping Networks
- Lift Station Control

Oil & Gas Applications - SCADAPack 3xx, 32

- Modbus™ core database, DNP3 level 2 layer, optional DF1 support
- Programming and configuration: TelePACE™ Studio, IEC61131-3, C/C++
- O&G-focused app: Realflo™

SCADAPack RTU	Analog Input[1]	Analog Output[1]	Digital Input[1]	Digital Output[1]	Frequency Input[1]	Counter Input[1]	Serial Port	Ethernet Port	USB Device Port	USB Host Port
330	0	0	0	0	1	2	3	1	1	1
334	8	2 (optional)	16	10	1	2	3	1	1	1
350	6	2 (optional)	8 (shared with digital outputs)	8 (shared with digital inputs)	1	2	3	1	1	1
357	14	2 or 4 (optional)	8 (shared with digital outputs) + 32	8 (shared with digital inputs) + 16	1	2	3	1	1	1
32P	0	0	3 (shared with counters)	1	1	3 (shared with digital inputs)	3	1	0	0
32P4	8	2 (optional)	3 (shared with counters) + 16	13	1	3 (shared with digital inputs)	4	1	0	0
32P4A	8	2 (optional)	3 (shared with counters) + 32 (shared with digital outputs)	1 + 32 (shared with digital inputs)	1	3 (shared with digital inputs))	4	1	0	0
32P4B	8	2 (optional)	3 (shared with counters) + 32	3 (shared with counters) + 16	1	3 (shared with digital inputs)	3	1	0	0

Footnotes:

[1] Number of on-board I/O may be further expanded for any SCADAPack using Expansion I/O Modules. Refer to individual product data sheets for detailed specifications.

Water Applications - SCADAPack 3xxE & 53xE

- DNP3 Level 4 core database, Modbus layer, IEC 60870-5-101/103/104, optional DF1 support
- Programming: IEC61131-3, configuration: E Configurator
- DNP3 Secure Authentication & IEEE 1711 (AGA12) support

SCADAPack RTU	Analog Input[1]	Analog Output[1]	Digital Input[1]	Digital Output[1]	Frequency Input[1]	Counter Input[1]	Serial Port	Ethernet Port	USB Device Port	USB Host Port
330E	0	0	0	0	1	2	3	1	1	1[2]
334E	8	2 (optional)	16	10	1	2	3	1	1	1[2]
337E	8	2 (optional)	32	16	1	2	3	1	1	1[2]
350E	6	2 (optional)	8 (shared with digital outputs)	8 (shared with digital inputs)	1	2	3	1	1	1[2]
357E	14	2 or 4 (optional)	8 (shared with digital outputs) + 32	8 (shared with digital inputs) + 16	1	2	3	1	1	1[2]
530E	0	0	2	1	0	0	4	3	1	1
535E	6	2 (optional)	8 (shared with counter inputs) + 10	9	0	8 (shared with digital inputs)	4	3	1	1

Footnotes:

[1] Number of on-board I/O may be further expanded for any SCADAPack using Expansion I/O Modules. Refer to individual product data sheets for detailed specifications.

[2] Component present but not supported.

Multiple Applications - SCADAPack x70

Oil and Gas:
- Tank monitoring and automation
- Well test automation
- Well production and optimization
- Measurement

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

SCADAPack RTU	Analog Input[1]	Analog Output[1]	Digital Input[1]	Digital Output[1]	Frequency Input[1]	Serial Port	Ethernet Port	USB Device Port	USB Host Port
470	4	0	4	2	4 (shared with DIs)	5	2	1	1
474	12	2	20	12	8 (shared with DIs	5	2	1	1
570	0	0	2	1	0	4	3	1	1
575	6	2 (option)	18	9	8 (shared with DIs)	4	3	1	1
574	8	2 (option)	18	11	0	4	3	1	1

Footnote:
[1] Number of on-board I/O may be further expanded for any SCADAPack using Expansion I/O Modules. Refer to individual product data sheets for detailed specifications.

Selection Guide
Standard SCADAPack

SCADAPack 32: P4A | P4 | P4B Specifications

Green Premium™ Product

P4A, integrated 5604 I/O board

Controller	
Processor	Hitachi SH-3 32-bit CMOS microcontroller, 120 MHz clock, integrated watchdog timer
Memory	8 Mb SDRAM, 4 Mb FLASH, 1 Mb CMOS RAM
Non-volatile RAM	CMOS RAM with lithium battery retains contents for 2 years with no power
I/O	
Analog Inputs	• 8, user-selectable 0...10 Vdc (15-bit) or 0...20 mA (14-bit) • 1, 0...32.768 Vdc (10-bit)
Analog Outputs	2 with optional 5305 analog output module, output range 0...20 mA
Digital Inputs	4 on controller board - 3 Digital Input/Counter, 1 Interrupt with optical isolation
Digital Outputs	1, 30 Vdc / 60 mA (used as status output)
Digital I/O 5604 I/O	32 configurable as input or output (1 A DC max output / dry contact input)
Additional I/O	
I/O Expansion	Supported modules: 5304, 5401, 5402, 5403, 5404, 5405, 5406A, 5407, 5409, 5410, 5411, 5414, 5415, 5502, 5504, 5505, 5506, 5606, 5607, 5904
Communications	
Serial Port COM1	Configurable RS-232 or RS-485, 2-wire half duplex or 4-wire full/half duplex
Serial Port COM2, COM4	• RS-232, DTE, 8 -pin modular jack, full or half duplex with RTS/CTS control • Implemented Td, Rd, CTS, RTS, DCD, DTR, +5 V
Serial Port COM3	Located on 5604 I/O module. Same specifications as COM2 and COM4
Baud Rates COM1, COM2 & COM4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200
Baud Rate COM3	1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200
Serial Protocols	Modbus RTU, Modbus ASCII, DNP3, DF1, PPP
Ethernet Port	RJ45, 10BaseT
Network Protocols	IP: ARP, TCP, TFTP, UDP, ICMP
Ethernet Port Protocols	Modbus/TCP, Modbus RTU in UDP, Modbus ASCII in UDP, DNP in TCP, DNP in UDP

Selection Guide
Standard SCADAPack

SCADAPack 32: P4A | P4 | P4B Specifications cont'd

Green Premium™ Product

P4A, integrated 5604 I/O board cont'd

General	
I/O Terminations	6, 8, 9 and 10-pole, removable terminal blocks, 12 to 22 AWG, 15 A contacts
Dimensions	213 mm W. x 155 mm H. x 72 mm D. (8.40 in. x 6.13 in. x 2.80 in.)
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, -40...70 °C (-40...158 °F)
Power Input	11...30 Vdc, 4.3 W typical (10.8 W full I/O capacity in use)
Certifications	
Hazardous Locations	Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations
North America	Temperature Code T4 per CSA Std C22.2 No. 213-M1987 / UL1604 UL listed and CSA certified to the following standards: • CSA Std. C22.2 No. 213-M1987 - Hazardous Locations • UL Std. No. 1604 - Hazardous (Classified) Locations
Safety	CSA (cCSAus) certified to the requirements of: CSA C22.2 No. 142-M1987 and UL508. (Process Control Equipment, Industrial Control Equipment) UL (cULus) listed: UL508 (Industrial Control Equipment)

Selection Guide
Standard SCADAPack

SCADAPack 32: P4A | P4 | P4B Specifications cont'd

Green Premium™ Product

P4, integrated 5601A I/O board

Controller	
Processor	Hitachi SH-3 32-bit CMOS microcontroller, 120 MHz clock, integrated watchdog timer
Memory	8 Mb SDRAM, 4 Mb FLASH, 1 Mb CMOS RAM
Non-volatile RAM	CMOS RAM with lithium battery retains contents for 2 years with no power
I/O	
Analog Inputs	8, user-selectable 0...5 Vdc (15-bit) or 0...20 mA (14-bit)
Analog Outputs	2 with optional 5303 analog output module, output range 0...20 mA
Digital Inputs	• 4 on controller board - 3 Digital Input/Counter, 1 Interrupt with optical isolation • 16 on 5601A I/O module - 6.5 mA typical at 24 Vdc and 3.5 mA typical at 115 V
Digital Outputs	• 1 on controller board , 30 Vdc, 60 mA (used as status output) • 12 on 5601A I/O module - Sealed mechanical relay: • 0.4 A at 125 Vrms, 2 A at 30 Vdc resistive loads • 1.0 A at 30 Vdc, 0.2 A at 125 Vrms inductive load with pf=0.4, L/R=7 ms • 250 Vrms, 220 Vdc maximum operating voltage
Additional I/O	
I/O Expansion	Supported modules: 5304, 5401, 5402, 5403, 5404, 5405, 5406A, 5407, 5409, 5410, 5411, 5414, 5415, 5502, 5504, 5505, 5506, 5606, 5607, 5904
Communications	
Serial Port COM1	Configurable RS-232 or RS-485, 2 wire half duplex or 4 wire full/half duplex
Serial Ports COM2, COM4	RS-232, DTE, 8 -pin modular jack, full or half duplex with RTS/CTS control. Implemented Td, Rd, CTS, RTS, DCD, DTR, +5 Vdc
Serial Port COM3	Located on 5601A I/O module. Same specifications as COM2 and COM4
Baud Rates COM1, COM2 & COM4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200
Baud Rate COM3	1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200
Serial Protocols	Modbus/RTU, Modbus ASCII, DNP3, DF1, PPP
Ethernet Port	10BaseT, RJ45
Network Protocols	IP: ARP, TCP, TFTP, UDP, ICMP
Ethernet Port Protocols	Modbus TCP, Modbus RTU in UDP, Modbus ASCII in UDP, DNP in TCP, DNP in UDP

Selection Guide
Standard SCADAPack

SCADAPack 32: P4A | P4 | P4B Specifications cont'd

Green Premium™ Product

P4, integrated 5601A I/O board cont'd

General	
I/O Terminations	6, 8, 9 and 10-pole, removable terminal blocks, 12 to 22 AWG, 15 A contacts
Dimensions	213 mm W. x 155 mm H. x 72 mm D. (8.40 in. x 6.13 in. x 2.80 in.)
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, -40...70 °C (-40...158 °F)
Power Input	11...30 Vdc, 3.5 W typical all relays off, 6.5 W typical all relays on
Certifications	
Hazardous Locations	Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations
North America	Temperature Code T4 per CSA Std C22.2 No. 213-M1987 / UL1604 UL listed and CSA certified to the following standards: CSA Std. C22.2 No. 213-M1987 - Hazardous Locations UL Std. No. 1604 - Hazardous (Classified) Locations
Safety	CSA (cCSAus) certified to the requirements of: CSA C22.2 No. 142-M1987 and UL508. (Process Control Equipment, Industrial Control Equipment) UL (cULus) listed: UL508 (Industrial Control Equipment)

Selection Guide
Standard SCADAPack

SCADAPack 32: P4A | P4 | P4B Specifications cont'd

Green Premium™ Product

P4B, integrated 5606 I/O board

Controller	
Processor	Hitachi SH-3 32-bit CMOS microcontroller, 120 MHz clock, integrated watchdog timer
Memory	8 Mb SDRAM, 4 Mb FLASH, 1 Mb CMOS RAM
Non-volatile RAM	CMOS RAM with lithium battery retains contents for 2 years with no power
I/O	
Analog Inputs	8, single-ended, software selectable 0...5 Vdc / 0...10 Vdc or 0...20 mA / 4...20 mA (15-bit resolution)
Analog Outputs	2 with optional 5305 analog output module, output range 0...20 mA
Digital Inputs	4 on controller board - 3 Digital Input/Counter, 1 Interrupt with optical isolation 32 on 5606 I/O module • 0.67 mA typical at 24 Vdc on the 12/24 Vdc range • 0.37 mA typical at 48 Vdc on the 48 Vdc range • 0.35 mA typical at 120 Vdc on the 115/125 Vdc range • 0.35 mA typical at 240 Vdc on the 240 Vdc range
Digital Outputs	1 on controller board , 30 Vdc, 60 mA (used as status output) 16 relay outputs on 5606 I/O module - dry contact or DC solid state: • Dry contact rating: 3 A, 30 Vdc or 240 Vac (Resistive) • DC solid state rating: 3 A, 60 Vdc
Additional I/O	
I/O Expansion	Supported modules: 5304, 5401, 5402, 5403, 5404, 5405, 5406A, 5407, 5409, 5410, 5411, 5414, 5415, 5502, 5504, 5505, 5506, 5606, 5607, 5904
Communications	
Serial Port COM1	Configurable RS-232 or RS-485, 2 wire half duplex or 4 wire full/half duplex
Serial Ports COM2, COM4	RS-232, DTE, 8-pin modular jack, full or half duplex with RTS/CTS control. Implemented Td, Rd, CTS, RTS, DCD, DTR, +5 Vdc
Baud Rates COM1, COM2 & COM4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200
Serial Protocols	Modbus RTU, Modbus ASCII, DNP3, DF1, PPP
Ethernet Port	10BaseT, RJ45
Network Protocols	IP: ARP, TCP, TFTP, UDP, ICMP
Ethernet Port Protocols	Modbus TCP, Modbus RTU in UDP, Modbus ASCII in UDP, DNP in TCP, DNP in UDP

Selection Guide
Standard SCADAPack

SCADAPack 32: P4A | P4 | P4B Specifications cont'd

Green Premium™ Product

P4B, integrated 5606 I/O board cont'd

General	
I/O Terminations	5, 6, 8, 9 and 10-pole, removable terminal blocks, 12 to 22 AWG, 15 A contacts
Dimensions	213 mm W. x 164 mm H. x 72 mm D. (8.40 in. x 6.48 in. x 2.80 in.)
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, -40...70 °C (-40...158 °F)
Power Input	11...30 Vdc, 4.3 W typical (10.8 W full I/O capacity in use)
Certifications	
Hazardous Locations	Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations
North America	Temperature Code T4 per CSA Std C22.2 No. 213-M1987 / UL1604 UL listed and CSA certified to the following standards: • CSA Std. C22.2 No. 213-M1987 - Hazardous Locations • UL Std. No. 1604 - Hazardous (Classified) Locations
Hazardous Locations Europe	Model "5606 SSR, 24DI version only" ATEX II 3G, Ex nA IIC T4 per EN 60079-15, protection type n (Zone 2). Does not include Wireless versions
Hazardous Locations	Model "5606 SSR version only" IECEx, Ex nA IIC T4 per IEC 60079-15, protection type n (Zone 2) Does not include Wireless versions
Safety	CSA (cCSAus) certified to the requirements of: CSA C22.2 No. 142-M1987 and UL508. (Process Control Equipment, Industrial Control Equipment) UL (cULus) listed: UL508 (Industrial Control Equipment)

Selection Guide

Standard SCADAPack

Green Premium™ Product

SCADAPack 32: P4A | P4 | P4B Model Code

Code	Select: Controller
TBUP4	SCADAPack 32, 32-Bit controller with Integrated Ethernet Port
Code	**Select: Lower I/O Module**
	5601A lower I/O module, includes 16 Digital Inputs, 12 Digital Outputs and 8 Analog Inputs (see options below)
A	5604 lower I/O module, includes 32 configurable Digital I/O and 8 selectable Analog Inputs (0...10 Vdc or 0...20 mA)
B	5606 lower I/O module, includes 32 D/I, 16 Dry Contact D/O and 8 software configurable A/I
C	5606-A lower I/O module, includes 32 D/I, 16 Solid State Relay D/O and 8 software configurable A/I
N	No lower I/O module (provides controller module only)
Code	**Select: Communication Serial Ports**
1	TBUP4/P4A/P4N: 3 RS232, 1 RS232/485, 1 Ethernet TBUP4B/P4C: 2 RS232, 1 RS232/485, 1 Ethernet
Code	**Select: Gas Flow Run-time Option**
0	None
	Flow Computer Runs
G	2 Run Gas Flow
F	4 Run Gas Flow
T	10 Run Gas Flow
	Flow Computer Runs - Gas Transmission Version (Requires Realflo 6.72+)
V	2 Run Gas Flow
W	4 Run Gas Flow

Selection Guide
Standard SCADAPack

Green Premium™ Product

SCADAPack 32: P4A | P4 | P4B Model Code cont'd

Code	Select: Protocol Option/Programming Environment
2	Modbus and DNP 3.0 (Level 2) protocol with Telepace Ladder Logic and C Language firmware loaded - IEC enabled
5	Modbus and DNP 3.0 (Level 2) protocol with IEC 61131-3 and C Language firmware loaded - Telepace enabled
Code	**Select: Analog Inputs**
01	0...20 mA, Single-ended (On TBUP4 & TBUP4A, Default on TBUP4B which is software configurable to 0...5 Vdc or 0...10 Vdc)
02	0...5 Vdc, Single-ended (TBUP4 Only)
03	0...10 Vdc, Single-ended (TBUP4A Only)
Code	**Select: Digital Inputs/Outputs**
0	Dry Contact Digital Inputs, Open Drain Digital Outputs, Individually configurable (TBUP4A Only)
0	24 Vdc D/I TBUP4 & TBUP4B: Dry Contact D/O TBUP4C: Solid State Relay D/O (Not for TBUP4A or TBU-P4N)
1	120 Vac D/I TBUP4 & TBUP4B: Dry Contact D/O TBUP4C: Solid State Relay D/O (Not for TBUP4A or TBU-P4N)
Code	**Select: Analog Outputs**
0	None (required for TBUP4N)
1	2 channel Analog Output option, 0...20 mA

Footnotes:

1. Available only with optional integrated wireless modules or with stand-alone wireless modules.

2. Not applicable in all countries.

Note: This product is RoHS-compliant.

Selection Guide

Standard SCADAPack

Green Premium™ Product

SCADAPack 330 | 334 Specifications

Controller	
Processor	• 32-bit ARM7 microcontroller, 32 MHz clock, integrated watchdog timer • Microcontroller, co-processor, 20 MHz clock
Memory	• 16 MB FLASH ROM, 4 MB CMOS RAM, 4 kB EEPROM • CMOS SRAM with lithium battery retains contents for 2 years with no power
Datalog Capacity	465,000 words
File System Typical Storage	Internal: 6 MB, external : up to 32 GB on USB memory stick
Communications	
Serial Port: COM1, COM2	RS-232 port, 8-pin modular RJ45 jack, full or half duplex, or RS-485 port, 2-wire, half-duplex, supports baud rates up to 115,200 bps in RS-232 mode
Serial Port : COM3	P330/P334 only, RS-232 port, 8-pin modular RJ45 jack, full or half duplex with RTS/CTS control and operator interface power control, supports baud rates up to 115,200 bps
Embedded Wireless	The controller may be equipped with an embedded license-free radio module (different options in 900 Mhz or 2.4 Ghz) that uses one of the serial ports
Serial Protocols	Modbus server/client, DF1 client/server, DNP3 level 2 server
Ethernet port (330/334 only)	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100Base-T), transformer-isolated
IP Protocols (330/334 only)	• Modbus/TCP Server, Modbus/TCP Client, Modbus RTU in TCP Client , DNP3 level 2 in TCP Server • FTP Server
Store & Forward	Stores & forwards frames between upstream and downstream SCADAPack 300 Smart RTUs
USB Device	USB 2.0-compliant “B”-type receptacle, for local configuration
USB Host	USB 2.0-compliant “A”-type receptacle, supports USB devices up to 32 GB (specific memory sticks supported)
General	
Logic Control	SCADAPack Telepace Studio ladder logic or IEC 61131-3 SCADAPack Workbench programming suite (LD, ST, FBD & SFC)
I/O Terminations	• SCADAPack 330: 6-pole connector, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded • SCADAPack 334: 5, 6, 7, 9-pole connectors, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded
Dimensions	• SCADAPack 330: 144.0 mm x 140.04 mm x 46.5 mm (5.65 in. wide x 5.53 in. high x 1.83 in. deep) • SCADAPack 334: 144.0 mm x 181.0 mm x 66.0 mm (5.65 in. wide x 7.13 in. high x 2.60 in. deep)
Enclosure	Corrosion-resistant zinc-plated steel with black enamel paint
Environment	• Conformal-coated; 5% RH to 95% RH, non-condensing • -40...+70 °C (-40...+158 °F) operating, -40...+85 °C (-40...+185 °F) storage
Shock & Vibration	IEC 60068-2-27 (tested up to 15 g), IEC 60068-2-6

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Standard SCADAPack

Green Premium™ Product

SCADAPack 330 | 334 Specifications cont'd

Power Supply

Rated Voltage	12...30 Vdc. Limit voltage: 11.5...32 Vdc; turn on voltage: 10...11.5 Vdc; turn off voltage: 9...10 Vdc
Maximum Power	7 W at 24 Vdc (internal 5 Vdc supply fully loaded)

Power Requirements

SCADAPack 330 and 334 support 3 power modes: sleep, normal clock speed and reduced clock speed

- Typical power consumption (at 20 °C/ 68 °F):

SCADAPack Model	Ethernet/ USB	DO Relays	At normal clock speed 12 V dc	At normal clock speed 24 V dc	At reduced clock speed 12 V dc	At reduced clock speed 24 V dc
Sleep Mode			80 mW	240 mW	80 mW	240 mW
330	OFF		0.7 W	0.9 W	0.5 W	0.7 W
	ON	-	1.8 W	2.0 W	1.6 W	1.8 W
334	OFF		0.9 W	1.2 W	0.7 W	1.0 W
	OFF	ON	2.9 W	3.4 W	2.7 W	3.2 W
	ON	OFF	2.4 W	2.8 W	2.3 W	2.6 W
	ON		4.0 W	4.5 W	3.8 W	4.3 W

Certifications

EMC and Radio Frequency	• ICES-003 Issue 5 August 2012 • CE and RCM markings
General Safety	UL 508
Hazardous Locations	cCSAus Non-incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D IECEx/ATEX Class I, Zone 2

Selection Guide
Standard SCADAPack

Green Premium™ Product

SCADAPack 330 | 334 Specifications cont'd

Controller Board	
Counter Inputs	• 1, 0...10 Hz (dry contact) • 2, 0...10 kHz (turbine or dry contact)
Internal Power Monitor	Power input - analog input and low indication, onboard lithium battery - low indication
Internal Temperature Monitor	Controller temperature range -40...+75 °C (-40...+167 °F)
I/O board (334 only)	
Analog Inputs	8, software-configurable to 0...20, 4...20 mA , 0...5 or 0...10 V, plus over range • Resolution: 15-bit ADC (15-bit over the measurement range in 10 V, 14-bit in 20 mA) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0. 2% over temperature range • Input Resistance: 250 Ω or 20 kΩ in 20 mA or 10 V configurations (60 kΩ for 32.768 V) • Normal rejection mode: 27 dB at 60 Hz • Sampling rate: 170 ms • Isolation: 500 Vac from logic and chassis
Analog Outputs	• 2 (optional), 0...20/4...20 mA, voltage output may be accomplished with external precision resistor • Same features as the analog outputs located on the controller board
Digital Inputs	16, 12…24 Vdc • Turn on voltage: 9 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.67 mA at 24 Vdc • Time stamping : 170 ms • Isolation: in group of 8, 1500 Vac from logic supply and chassis
Digital Outputs	10, dry-contact relays or solid-state relays (Form A - normally open) • 5 contacts share one common • Isolation: Chassis or logic to contact 1500 Vac (1 min.) Dry-contact relays: • Contact rating 3 A, 30 Vdc (resistive), 12 A maximum per common Solid state relays: • Load voltage 60 Vdc maximum • Load current 3 A continuous max at 50 °C (122 °F) or 2 A at 70 °C (158 °F)
Additional IO	
I/O Expansion	Supported modules: • Current 5000 modules Maximum number of modules per unit: • SCADAPack 330: 8 (*) • SCADAPack 334: 7 (*) (*): to reach this limit, additional power supply modules (reference: 5103) are required

Selection Guide
Standard SCADAPack

Green Premium™ Product

SCADAPack 330 | 334 Model Code

Code	Select: Controller
TBUP330	SCADAPack 330, Controller 32-bit
TBUP334	SCADAPack 334, Controller 32-bit
Code	**Select: Future Option**
1	None
Code	**Select: Gas & Liquids Flow Run-Time Option**
A	None
	Gas Only Flow Computer Options
G	2 Run Gas Flow
F	4 Run Gas Flow
V	2 Run Gas Flow - Gas Transmission Version (Requires Reaflo 6.72+)
W	4 Run Gas Flow - Gas Transmission Version (Requires Realflo 6.72+)
	Gas & Liquids Flow Computer Options
L	Gas & Liq 1: Supports 1 Gas run, 1 Liquid run, and 1 Water run
M	Gas & Liq. 2: Supports 2 Gas runs, 2 Liquid runs, and 2 Water runs
N	Gas & Liq. 3: Supports 3 Gas runs, 3 Liquid runs, and 3 Water runs
P	Liq. 4: Supports 4 Liquid runs and 4 Water runs
Code	**Select: Protocol Option**
2	Modbus and DNP3 level 2 protocol emulation
Code	**Select: Programming Environment**
0	Telepace Ladder logic and C language firmware loaded - IEC 61131-3-enabled (Programming tools sold separately)
1	IEC 61131-3 and C language firmware loaded - Telepace-enabled (Programming tools sold separately)
Code	**Select: Analog Inputs**
A	P330: none. P334 : 8 selectable as 0...20 mA, 4...20 mA, 0...5 Vdc or 0...10 Vdc
Code	**Select: Digital Inputs/Outputs**
A	P330: none
B	P334: adds 32 16 digital inputs (12...24 Vdc), 10 digital outputs (Dry Contact relay for Class I Div 2, Solid State relay for IECEx/ATEX)
Code	**Select: Analog Outputs**
0	None
1	P334 only: 2 channel Analog Output, 0...20 mA, external DC supply

Selection Guide
Standard SCADAPack

Green Premium™ Product

SCADAPack 330 | 334 Model Code cont'd

Code	Select: Future Option
0	None
Code	**Select: Certifications**
S	With FCC, UL508, CE marking and RCM
X	Adds IECEx/ATEX Class I, Zone 2
U	Adds cCSAus Nonincendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D

Selection Guide

Standard SCADAPack

Green Premium™ Product

SCADAPack 350 | 357 Specifications

Controller	
Processor	• 32-bit ARM7 microcontroller, 32 MHz clock, integrated watchdog timer • Microcontroller, co-processor, 20 MHz clock
Memory	• 16 MB FLASH ROM, 4 MB CMOS RAM, 4 kB EEPROM • CMOS SRAM with lithium battery retains contents for 2 years with no power
Datalog Capacity	465,000 words
File System Typical Storage	Internal: 6 MB, external : up to 32 GB on USB memory stick
Communications	
Serial Port: COM1, COM2	• RS-485, 2-pole removable terminal block, 2-wire, half duplex, supports baud rates up to 115,200 bps • RS-232 port, 8-pin modular RJ45 jack, full or half duplex, or RS-485 port, 2-wire, half-duplex, supports baud rates up to 115,200 bps in RS-232 mode
Serial Port : COM3	RS-232 port, 8-pin modular RJ45 jack, full or half duplex with RTS/CTS control and operator interface power control, supports baud rates up to 115,200 bps
Serial Protocols	Modbus client/server, DF1 client/server, DNP3 level 2 server
Ethernet Port	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100 Base-T), transformer-isolated
IP Protocols	• Modbus/TCP Server, Modbus/TCP Client, Modbus RTU in TCP Client , DNP3 level 2 in TCP Server • FTP Server
Store & Forward	Stores & forwards frames between upstream and downstream SCADAPack 300 Smart RTUs
USB Device	USB 2.0-compliant “B”-type receptacle, for local configuration
USB Host	USB 2.0-compliant “A”-type receptacle, supports USB devices up to 32 GB (specific memory sticks supported)
General	
Logic Control	SCADAPack Telepace Studio ladder logic or IEC 61131-3 SCADAPack Workbench programming suite: (LD, ST, FBD & SFC)
I/O Terminations	• SCADAPack 350: 6, 12-pole connector, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded • SCADAPack 357: 5, 6, 7, 9, 10, 12-pole connectors, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded
Dimensions	• SCADAPack 350: 211.8 mm x 140.4 mm x 46.5 mm (8.34 in. wide x 5.53 in. high x 1.83 in. deep) • SCADAPack 357: 211.8 mm x 181.0 mm x 66.0 mm (8.34 in. wide x 7.13 in. high x 2.60 in. deep)
Enclosure	Corrosion-resistant zinc-plated steel with black enamel paint
Environment	• Conformal coated • -40...+70 °C (-40...+158 °F) operating, -40...+85 °C (-40...185 °F) storage • 5% RH to 95% RH, non-condensing
Shock & Vibration	IEC 60068-2-27 (tested up to 15 g), IEC 60068-2-6

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SCADAPack 350 | 357 Specifications cont'd

Power Supply

Rated Voltage	12...30 Vdc. Limit voltage: 11.5...32 Vdc; turn on voltage: 10...11.5 Vdc; turn off voltage: 9...10 Vdc
Maximum Power	12 W at 24 Vdc (internal 5 Vdc supply fully loaded and Vloop on and boosted, fully loaded)
Power Requirements	SCADAPack 350/357 support 3 power modes: sleep, normal clock speed and reduced clock speed • SCADAPack 350 typical power consumption (at 20 °C/ 68 °F):

SCADAPack 350				At normal clock speed		At reduced clock speed	
	Ethernet	Controller LEDs	Vloop fully loaded	12 V dc	24 V dc	12 V dc	24 V dc
Sleep Mode	-			15 mW	27 mW	15 mW	27 mW
Use case 1	OFF			0.7 W	0.6 W	0.5 W	0.4 W
Use case 2	ON	OFF	OFF	1.6 W	1.5 W	1.4 W	1.3 W
Use case 3	OFF	OFF	ON	4.3 W	4.1 W	4.1 W	3.9 W
Use case 4	ON			5.2 W	5.0 W	5.0 W	4.8 W

• SCADAPack 357 typical power consumption: from 15 mW at 12 Vdc in sleep mode to 8.9 W (with up to 7 analog input/output loops powered from Vloop supply)

Power outputs	Vloop • Maximum 140 mA at 12 V (booster turned off) or 24 Vdc (booster turned on); can power up to 7 analog input/output loops

Certifications

EMC and Radio Frequency	• ICES-003 Issue 5 August 2012 • CE and RCM markings
General Safety	UL 508
Hazardous Locations	• cCSAus Non-incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D • IECEx/ATEX Class I, Zone 2

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SCADAPack 350 | 357 Specifications cont'd

Controller Board	
Analog Inputs	5, user-selectable 0...10 V or 0...20 mA plus over range • 1, 0...32.7 Vdc (15-bit) for DC supply monitoring • Resolution: 15-bit ADC (15-bit over the measurement range in 10 V, 14-bit in 20 mA) • Accuracy: ±0.1% of full scale at 25 °C (+77 °F), ±0.2% over temperature range • Input Resistance: 250 Ω or 20 kΩ in 20 mA or 10 V configurations (60 kΩ for 32.768 V) • Normal rejection mode: 27 dB at 60 Hz
Analog Outputs	2 (optional), 0...20 mA, 4...20 mA, voltage output may be accomplished with external precision resistor • Resolution: 12-bit over 0...20 mA range • Accuracy: ±0.15% at 25 °C (+77 °F), ±0.35% of full scale over temperature range • Response Time: less than 10 µs for 10% to 90% signal change • Power Supply: 12…30 Vdc, external • Power (Current) Requirements: 10 mA plus up to 20 mA per output • Isolation: isolated from RTU logic and chassis • Load Range: 12 Vdc: 0…375 Ω, 24 Vdc: 0…925 Ω, • Logic End-Of- Scan to Signal Update Latency: typically 18... 27 ms
Digital Inputs/Outputs	8, user-selectable as inputs or outputs (open drain) As Digital Inputs • Dry contact As Digital Outputs • Sinking MOSFET output, rated 30 V, 0.5 A, ground return connected to Chassis Ground
Counter Inputs	• 1, 0...10 Hz (dry contact) • 2, 0...10 kHz (turbine or dry contact)
Internal Power monitor	Power input - analog input and low indication, onboard lithium battery - low indication
Internal Temperature Monitor	Controller temperature range -40 °C...+75 °C (-40...+167 °F)
I/O board (357 only)	
Analog Inputs	8, software-configurable to 0...20, 4...20 mA , 0...5 or 0...10 V Same features as for the 5 analog inputs located on the controller board (see above) except the following: • Isolation: 500 Vac from logic and chassis
Analog Outputs	2 (optional), 0...20/4...20 mA, voltage output may be accomplished with external precision resistor. Same features as for the analog outputs located on the controller board
Digital Inputs	32, 12…24 Vdc • Turn on voltage: 9 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.67 mA at 24 Vdc • Time stamping : 170 ms • Isolation : in group of 8, 1500 Vac from logic supply and chassis
Digital Outputs	16, relays (Form A) • 4 contacts share one common • Isolation : isolated in groups of 4. Isolated from RTU logic, RTU chassis and other groups to 1500 Vac • Contact Rating: 3 A, 30 Vdc

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SCADAPack 350 | 357 Specifications cont'd

Additional IO	
I/O Expansion	Supported modules : • Current 5000 modules Maximum number of modules per unit: • SCADAPack 350: 8 (*) • SCADAPack 357: 7 (*) (*): to reach this limit, additional power supply modules (reference: 5103) are required

SCADAPack 350 | 357 Model Code

Code	Select: Controller
TBUP350	SCADAPack 350, Controller 32-bits, 5 Analog Inputs, 8 Digital I/O, 3 High Speed Counter Inputs
TBUP357	SCADAPack 357, Controller 32-bits, comes with the above plus additional I/Os
Code	**Select: Future Option**
1	None
Code	**Select: Gas & Liquids Flow Run-Time Option**
A	None
	Gas Only Flow Computer Options
G	2 Run Gas Flow
F	4 Run Gas Flow
V	2 Run Gas Flow - Gas Transmission Version (Requires Reaflo 6.72+)
W	4 Run Gas Flow - Gas Transmission Version (Requires Realflo 6.72+)
	Gas & Liquids Flow Computer Options
L	Gas & Liq 1: Supports 1 Gas run, 1 Liquid run, and 1 Water run
M	Gas & Liq. 2: Supports 2 Gas runs, 2 Liquid runs, and 2 Water runs
N	Gas & Liq. 3: Supports 3 Gas runs, 3 Liquid runs, and 3 Water runs
P	Liq. 4: Supports 4 Liquid runs and 4 Water runs
Code	**Select: Protocol Option**
2	Modbus and DNP3 level 2 protocol emulation
Code	**Select: Programming Environment**
0	Telepace Ladder logic and C language firmware loaded - IEC 61131-3-enabled (Programming tools sold separately)
1	IEC 61131-3 and C language firmware loaded - Telepace-enabled (Programming tools sold separately)

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SCADAPack 350 | 357 Model Code cont'd

Code	Select: Analog Inputs
A	P350 : 5 selectable as 0...10 V or 0...20 mA *P357 : adds 8 selectable as 0...20 mA, 4...20 mA, 0...5 V or 0...10 V
Code	**Select: Digital Inputs/Outputs**
A	P350: 8 Digital I/O, individually selectable as digital input (Dry Contact) or digital output (Open Drain)
B	P357: adds 32 digital inputs (12...24 Vdc), 16 digital outputs (Dry Contact relay for Class I Div 2, Solid State relay for IECEx/ATEX)
Code	**Select: Analog Outputs**
0	None
1	2 channel Analog Output, 0..20 mA, external DC supply
2	P357 only : 4 channel Analog Output, 0..20 mA, external DC supply
Code	**Select: Future Option**
0	None
Code	**Select: Certifications**
S	With FCC, UL508, CE marking and RCM
X	Adds IECEx/ATEX Class I, Zone 2
U	Adds cCSAus Nonincendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D

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SCADAPack x70

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SCADAPack 470 | 474 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
Maximum DNP3 and IEC 60870-5-104 events	Up to 40,000 time-stamped DNP3 events (reduced if database exceeds 10,000 objects)
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 (polled by the SCADAPack when it is operating as a DNP3 Master)	Approximately 90
Maximum DNP3 Outstation objects (polled by the SCADAPack when it is operating as a DNP3 Master)	Approximately 15,000* across DNP3 Outstation devices
Maximum Modbus Server Devices when polled using the configurable Modbus Scanner**	150
Maximum objects mapped from Modbus devices	3,000*
File System Storage	Approximately 70 MB
USB host storage	• Single-partition plug-in USB mass storage devices up to 32 GB • File format: FAT32
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/master 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 Master/Outstation and peer-to-peer, • Modbus/TCP Server, Modbus/TCP Client • IEC 60870-5-104 controlled station • Telnet Server, FTP Server

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SCADAPack x70

SCADAPack 470 | 474 Specifications cont'd

Communications cont'd	
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

* Varies depending on object types, event storage, and integrated application memory usage.
** 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).

General	
Logic Control	RemoteConnect software (SCADAPack x70 Logic with five IEC 61131-3 languages)
I/O Terminations	3.3...0.08 mm2 (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 with black enamel paint • 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

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SCADAPack 470 | 474 Specifications cont'd

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 compliance with RoHS, WEEE directives and REACH regulation, visit the Schneider Electric Check a Product portal at https://www.reach.schneider-electric.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
Specific Countries	• For Australia and New Zealand: ACMA requirements for RCM marking • For United States: FCC Part 15 Subpart B Class A • For Eurasian Economic Union: EAC

Digital and Analog Inputs/Outputs

	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 Controller Board:	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). 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)

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SCADAPack x70

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SCADAPack 470 | 474 Specifications cont'd

Additional I/O	
Supported Modules	• 5304, 5405, 5414, 5415, 5506, 5606, 5607, 6601, 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 *	• 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.)

* Additional power supply modules (model 5103) may be required for additional bus power, depending on how many expansion modules are included on the bus. Refer to the SCADAPack x70 Documentation Set for further details.

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SCADAPack 470 | 474 Model Code

Code	Select: Hardware Platform
TBUP470	SCADAPack 470, 32-bit controller, Dual Core
TBUP474	SCADAPack 474, 32-bit controller, Dual Core comes with additional I/O
Code	**Select: Firmware Platform**
U	SCADAPack x70 Firmware (RemoteConnect Configuration & IEC 61131-3 programming software, included)
Code	**Select: SCADA Security**
A	Standard security features
C	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
Code	**Select: License Option**
0	None
7	DNP3 Data Concentrator Master License – allows collection of DNP3 events and data from multiple outstations
Code	**Select: Analog Inputs**
A	P470: 4 Analog Inputs, selectable as 0…20 mA, 4…20 mA, 0…5 Vdc, 1…5 Vdc
B	P474: adds 8 Analog Inputs, factory-shipped selectable as 0…20 mA, 4…20 mA, 0…5 Vdc, 1…5 Vdc, and 2 Analog Outputs, selectable as 0...20 or 4...20 mA
Code	**Select: Digital Inputs/Outputs**
A	P470: 4 Digital Inputs (12...24 Vdc), 2 Digital Outputs Form A, NO (Normally Open) relays
B	P474: adds 16 Digital Inputs (12...24 Vdc) and 10 Digital Outputs Form A NO (Normally Open) relays
Code	**Select: Analog Outputs**
0	None
1	574 and 575: 2 channel Analog Output option, shipped selectable as 0…20 mA or 4…20 mA, external DC supply required
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	10 Runs - any combination of gas, liquid or water totaling 10 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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SCADAPack 570 | 574 | 575 Specifications

Architecture	
Processor	SPEAr 1380 32-bit dual-core Cortex A9 microcontroller, 500 MHz
Memory	• 128 MB NAND FLASH, 128 MB DDR3 RAM • Non-Volatile RAM CMOS SRAM with lithium battery retains contents for 2 years with no power
Maximum DNP3 and IEC 60870-5-104 events	Up to 40,000 time-stamped DNP3 events (reduced if database exceeds 10,000 objects)
Database Capacity	Typical maximum 15,000 objects, max. number of logic connected objects is 6000 (subset of 15,000 total objects)
DNP3 Data Concentrator Client	(Optional) Manages up to 100* DNP3 peer (server) devices for collection of DNP3 data and events from other DNP3 outstations
DNP3 Client Stations	Up to 3
DNP3 Peer Devices	Up to 90
Modbus Client	Up to 80* simultaneous Modbus TCP client (outgoing client) connections
Modbus Server	Up to 20* Modbus TCP server (incoming server) connections
File System Storage	Internal: 70 MB usable; External: 32 GB (using optional memory stick)
USB host storage	• Single-partition plug-in USB mass storage devices up to 32 GB • File format: FAT32
Communications	
Serial Ports: Serial1, Serial2	RS-232 port, 8-pin modular RJ45 jack, +5 Vdc power control, hardware handshaking, maximum baud rate 115,200 bps • Rated to ±15 kV (IEC 61000-4-2, Air Discharge) static protection
Serial Ports: Serial3, Serial4	Configurable as: • RS-232 or RS-485 two wire, half duplex, maximum baud rate 115,200 bps • 8-pin modular RJ45 jack, rated to ±15 kV (IEC 61000-4-2, Air Discharge) static protection
Serial Protocols	DNP3 level 4 server/client and peer-to-peer, Modbus RTU server/client
Ethernet Ports: Eth1, Eth2, Eth3	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100 Base-T), transformer isolated
IP Protocols	• DNP3 level 4 in TCP or in UDP Client/Server and peer-to-peer, • Modbus/TCP Server, Modbus/TCP Client • IEC 60870-5-104 controlled station • Telnet Server, FTP Server • HART pass through over TCP when connected to SCADAPack 6602 modules
USB Device Port	USB 2.0-compliant “B”-type receptacle, for local configuration
USB Host Port	USB 2.0-compliant “A”-type receptacle, supports USB devices up to 32 GB

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SCADAPack x70

SCADAPack 570 | 574 | 575 Specifications

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General

Logic Control	RemoteConnect software (five IEC 61131-3 languages)
I/O Terminations	Plug-in terminal blocks 0.0810...3.31 mm2 (28...12 AWG), solid or stranded
Dimensions	• SCADAPack 570: 150.5 mm x 134.8 mm x 74.9 mm (5.93 in. wide x 5.31 in. high x 2.95 in. deep) • SCADAPack 574: 150.5 mm x 181.7 mm x 91.0 mm (5.93 in. wide x 7.15 in. high x 3.58 in. deep) • SCADAPack 575: 150.5 mm x 182.3 mm x 86.5 mm (5.93 in. wide x 7.18 in. high x 3.41 in. deep)
Packaging	• Corrosion-resistant zinc-plated steel with black enamel paint • Conformal coated circuit boards
Environment	• Operating temperature -40...70 °C (-40...158 °F), storage temperature, -40...85 °C (-40...185 °F) • 5% RH to 95% RH, non-condensing
Shock & Vibration	IEC 61131-2 mechanical shock (tested up to 15 g shock), IEC 61131-2 vibration
Realflo Flow Computer	Flow Run License Options: • 3 Runs - any combination of gas, liquid or water totaling 3 runs (gas runs include gas transmission option) • 6 Runs - any combination of gas, liquid or water totaling 6 runs (gas runs include gas transmission option) • 10 Runs - any combination of gas, liquid or water totaling 10 runs (gas runs include gas transmission option)

Power Supply

Rated Voltage and Power	12...30 Vdc: 570 typical 4.3 W, 574 typical 6.5 W, Max. 9.2 W, 575 typical 5.4 W, Max. 9.1 W, Class 2 power supply required

Certifications

EMC & Radio Frequency	• FCC 47 CFR Part 15, Subpart B • ICES-003 • CE and RCM markings
General Safety	• 570 and 575: UL 508 • 574: IEC 61010-2-201; UL; CSA
Hazardous locations (option)	• cCSAus Non-Incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D and Class I, Zone 2 • IECEx/ATEX Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +70 °C

These are Green Premium products and RoHS and REACH-compliant.

Digital and Analog Inputs/Outputs

	Digital Inputs		Digital Outputs		Counter Inputs			Analog inputs Lower IO Module:	Analog outputs (option) Lower IO Module:
	Controller Board: 10 ms SOE	Lower IO Module: 1 ms SOE	Controller Board:	Lower IO Module:	Controller Board: 10 KHz (shared)	Lower IO Module: 1.5 KHz (shared)	Lower IO Module: 150 Hz (shared)		
570	2	-	1	-	2	-	-	-	-
574	2	16	1	10	2	-	-	8	2
575	2	16	1	8	2	4	4	6	2

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SCADAPack 570 | 574 | 575 Specifications cont'd

Digital and Analog Inputs/Outputs cont'd	
Digital Inputs	Controller Board: 2 • Din1...2 • 12…24 Vdc • DC input current: 0.4 mA at 12 Vdc, 0.8 mA at 24 Vdc • Ground return connected to Chassis Ground Lower IO Module 574: 16 • DI0...15 • 12…24 Vdc, Turn-on voltage: 9 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.67 mA typical at 24 Vdc • Isolation: in groups of 8, 1500 Vac from logic supply and chassis Lower IO Module 575: 16 • DI1...16 • 12…24 Vdc • DC input current: 1.2 mA at 12 Vdc, 2.4 mA at 24 Vdc • Isolation: in 2 groups of 8. Isolation from RTU logic and chassis: 1000 Vac/ 1500 Vdc
Counter Inputs	Controller Board: 2 • DI1...2 • Shared with 2 digital input channels • 0…10 kHz Lower IO Module 575: 8 • DI1...4: 0…1.5 kHz • DI5...8: 0…150 Hz • Shared with first 8 digital input channels on lower I/O board
Digital Outputs	Controller Board: 1 • Dout • Sinking MOSFET output, rated 30 Vdc, 0.5 A, ground return connected to Chassis Ground Lower IO Module 574: 10 • DO0...9 • Dry-contact or solid-state relays (Form A - normally open) • 5 contacts share one common • Isolation: Chassis or logic to contact 1500 Vac (1 min.) • Controls: (DNP3 protocol) Direct Operate, Select Before Operate, Trip/Close, Latch, Pulse Dry-contact relays: • Contact rating 3 A, 30 Vdc (resistive), 12 A maximum per common Solid-state relays: • Load voltage 30 Vdc maximum • Load current 2 A continuous max at 50 °C (122 °F), or 1.33 A at 70 °C (158 °F) ambient Lower IO Module 575: 8 • DO1...8 • 2 Form C relays: SPDT, separate Normally Open/Normally Closed/Common) • 6 Form A relays: Normally Open, one shared common • Isolation: 500 Vac minimum to RTU logic • Maximum Switching Voltage: 30 Vdc or 25 Vac • Maximum Switching Load: 60 W or 50 VA (2 A) • Status & Reporting: Individual relay status feedback to software for quality indication • Controls (DNP3 Protocol): Direct Operate, Select Before Operate, Trip/Close, Latch, Pulse

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SCADAPack 570 | 574 | 575 Specifications cont'd

Digital and Analog Inputs/Outputs cont'd	
Analog Inputs	Lower IO Module 574: 8 • AI0...7 • Software-configurable: 0...20 mA, 4...20 mA, 0...5 Vdc or 0...10 Vdc, plus over range • Resolution: 15-bit ADC (15-bit in measurement range 0…10 Vdc, and 14-bit in 5 Vdc or 20 mA input ranges) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0. 2% over temperature range • Input Resistance: 250 Ω in current ranges, 20 kΩ in voltage ranges • Normal mode rejection: 27 dB at 60 Hz • Sampling rate: 170 ms • Isolation: 500 Vac from logic and chassis Lower IO Module 575: 6 • AI1...6 • Dipswitch-configurable to current or voltage input • Input ranges: 0…20 mA, 4…20 mA, 0…5 Vdc, 1…5 Vdc • Uni-polar, differential • Resolution: 24-bit ADC (19-bit over the measurement range) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0.2% over temperature range • Isolation: 250 Vac isolation from channel to channel and from logic and chassis • Input Resistance: 250 Ω or 800 kΩ in current/voltage configurations • Under range: 4...20 mA measures to 0 mA • Common Mode Rejection: -80 dB @ 50/60 Hz • Sampling rate: software-selectable to 30 ms (unfiltered) or 500 ms (filtered)
Analog Outputs	Lower IO Module 574: 2 • AO0...1 • Optional • 0...20 mA or 4...20 mA, voltage output may be accomplished with external precision resistor. Lower IO Module 575: 2 • AO1...2 • Optional • Output ranges: 0...20 mA, 4...20 mA, voltage output may be accomplished with external precision resistor • Uni-polar • Resolution: 12-bit over 0...20 mA range • Accuracy: ±0.15% at 25 °C, ±0.35% of full scale over temperature range • Power Supply: 12…30 Vdc, external, Current: 50 mA • Isolation: transformer, 500 Vdc maximum to RTU logic and chassis • Load Range: 12 Vdc: 0…475 Ω, 24 Vdc: 0…1075 Ω • Status & Reporting: Individual Open Loop status to software for quality indication • Controls DNP3 Protocol: Direct Operate, Select Before Operate
Internal Power Monitor	• Input voltage monitor with low voltage indication • Memory/RTC battery voltage monitor with low voltage indication
Internal Temperature Monitor	Measurement range -40…75 °C (-40...167 °F)

Additional I/O	
Supported Modules	Supported modules: • 5304, 5405, 5414, 5415, 5506, 5606, 5607, 6601, 6602 • When SCADAPack x70 controller is used with 5000 series modules, order one adaptor cable ref. TBUM297138 to adapt from 20 conductors to 16 conductors).
I/O Expansion Limits	• Refer to the SCADAPack x70 Documentation Set > Hardware Manuals for further details.

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SCADAPack x70

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SCADAPack 570 | 574 | 575 Model Code

Code	Select: Hardware Platform
TBUP570	SCADAPack 570, 32-bit controller, Dual Core
TBUP574	SCADAPack 574, 32-bit controller, Dual Core, comes with additional I/O
TBUP575	SCADAPack 575, 32-bit controller, Dual Core comes with additional I/O
Code	**Select: Firmware Platform**
U	SCADAPack x70 Firmware (RemoteConnect Configuration & IEC 61131-3 programming software, included)
Code	**Select: SCADA Security**
A	None
C	DNP3 Secure Authentication SAv2 (Security Administrator application required)
Code	**Select: Protocol Option**
5	DNP3 Serial/IP client/server/peer-to-peer, Modbus RTU/TCP client/server, TCP/IP
Code	**Select: License Option**
6	None
7	DNP3 Data Concentrator Client License - allows collection of DNP3 events and data from multiple outstations
Code	**Select: Analog Inputs**
A	570: None 574, adds 8, selectable as 0...20 mA, 4...20 mA, 0...5 Vdc, 1...5 Vdc, or 0...10 Vdc 575: adds 6, selectable as 0…20 mA or 4…20 mA
B	575: adds 6, shipped selectable as 0…5 Vdc or 1…5 Vdc
Code	**Select: Digital Inputs/Outputs**
A	570: 2 Digital Inputs (12...24 Vdc), 1 Digital Output (open collector)
B	• 574: Upper I/O: 2 Digital Inputs (12...24 Vdc), 1 Digital Output (open collector), Lower I/O: 16 Digital Inputs (12...24 Vdc) & 10 DO (Dry Contact relays • 575: adds 16 Digital Inputs (12...24 Vdc) and 8 Dry Contact Relay outputs (6 Form A, 2 Form C)
C	574: Upper 2 Digital Inputs (12...24 Vdc), 1 Digital Output (open collector), Lower I/O: 16 Digital Inputs (12...24 Vdc) & 10 DO (Solid State relays)
Code	**Select: Analog Outputs**
0	None
1	574 and 575: 2 channel Analog Output option, shipped selectable as 0…20 mA or 4…20 mA, external DC supply required

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SCADAPack 570 | 574 | 575 Model Code cont'd

Code	Select: Realflo Flow Computer - Flow Run License Options
0	None
3	3 Runs - any combination of gas, liquid or water totalling 3 runs (gas runs include gas transmission option)
6	6 Runs - any combination of gas, liquid or water totalling 6 runs (gas runs include gas transmission option)
T	10 Runs - any combination of gas, liquid or water totalling 10 runs (gas runs include gas transmission option)
Code	**Select: Certifications**
S	EMC and radio frequency; FCC 47 CFR Part 15, Subpart B; ICES-003; CE and RCM markings
X	Adds IECEx/ATEX: Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +70 °C
U	Adds cCSAus Non-Incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D and Class I, Zone 2

SCADAPack 570 | 574 | 575 - I/O Expansion Modules (6xxx)

Part No.	Expansion Modules (complete the following part numbers with an S, U, or X suffix depending on certification required)
Models supported by SCADAPack 530E/535E/570/574/575 models only	
TBUX297583	Model 6601-20 mA, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/4…20 mA)
TBUX297584	Model 6601-5V, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/1…5 Vdc)
TBUX297585	Model 6601-20 mA, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/4…20 mA), 2 A/O (external DC supply)
TBUX297586	Model 6601-5V, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/1…5 Vdc), 2 A/O external DC supply)
TBUX297590	Model 6602, Analog I/O, HART, 8 A/I, 4 A/O, 4...20 mA (requires external DC supply)
TBUX297591	Model 6602, Analog I/O, HART, 8 A/I, 4...20 mA

Footnotes: Additional power supply modules (model 5103) may be required for additional bus power, depending on how many expansion modules are included on the bus.

Refer to the SCADAPack x70 Documentation Set for further details.

Note: This product is RoHS-compliant.

Selection Guide
SCADAPack E

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SCADAPack 330E | 334E | 337E Specifications

Controller				
Processors	• 32-bit ARM7 microcontroller, 32 MHz clock, integrated watchdog timer. • Two microcontroller IO co-processors, 20 MHz clock			
Memory	• 16 MB FLASH ROM, 4MB CMOS RAM, 4kB EEPROM • CMOS SRAM with lithium battery retains contents for 2 years with no power			
Event Logging Capacity (events)	20,000 events			
Database Capacity	Up to 1,000 points			
Resolution Data Concentrator Capacity (points)	Up to 500 in DNP3 or Modbus			
Data Concentrator Capacity (devices)	Up to 10 in DNP3 and up to 10 in Modbus or DF1			
File System Typical Storage	Internal: 6 MB			
Communications				
Serial Ports : COM1, COM2	RS-232 port, 8-pin modular RJ45 jack, full or half duplex, or RS-485 port, 2-wire, half-duplex, supports baud rates up to 115,200 bps in RS-232 mode			
Serial Port : COM3	RS-232 port, 8-pin modular RJ45 jack, full or half duplex with RTS/CTS control and operator interface power control, supports baud rates up to 115,200 bps			
Serial Protocols	DNP3 level 4 server/client and peer-to-peer, IEC 60870-5-101 server, Modbus server/client, DF1 client			
Ethernet port	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100 Base-T), transformer-isolated			
IP Protocols	• DNP3 level 4 in TCP Client/Server, UDP Client/Server and peer-to-peer, IEC 60870-5-104 Server, Modbus/TCP Server, Modbus/TCP Client, Modbus RTU in TCP Client • NTP Client/Server, Telnet Server, FTP Server, BOOTP Server			
Client - Server Capability	• Can simultaneously report to up to multiple independent active clients: 3 in DNP3, 2 in IEC 60870-5-101/-104, 5 in Modbus TCP and 3 in Modbus RTU, and connect to up to 100 remote devices in DNP3 peer-to-peer • As a data concentrator it can manage up to 10 local or remote DNP3 servers, and up to 10 local servers communicating with Modbus RTU, Modbus TCP or DF1 serial			
USB Device	USB 2.0-compliant “B”-type receptacle, for local configuration			
General				
Logic Control	IEC 61131-3 SCADAPack Workbench programming suite (LD, ST, FBD & SFC)			
I/O Terminations	SCADAPack Model	330E	334E	337E
	Connectors, 0.0810...3.31 mm² (28...12 AWG), solid or stranded	6-pole	5, 6, 9, 12-pole	5, 6, 9, 10-pole

Selection Guide
SCADAPack E

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SCADAPack 330E | 334E | 337E Specifications cont'd

General cont'd

Dimensions	SCADAPack Model	330E	334E	337E
	Width mm (in.)	144 (5.65)	144 (5.65)	211.8 (8.34)
	Height mm (in.)	140.4 (5.53)	181.0 (7.13)	181.0 (7.13)
	Depth mm (in.)	46.5 (1.83)	66.0 (2.60)	66.0 (2.60)
Enclosure	Corrosion-resistant zinc-plated steel with black enamel paint			
Environment	• Conformal coated • -40...+70 °C (-40...+158 °F) operating, -40...+85 °C (- 40...+185 °F) storage • 5% RH to 95% RH, non-condensing			
Shock & Vibration	IEC 60068-2-27 (tested up to 15 g), IEC 60068-2-6			

Power Supply

Rated Voltage	12...30 Vdc. Limit voltage: 11.5...32 Vdc; turn on voltage: 10...11.5 Vdc; turn off voltage: 9...10 Vdc			
Maximum Power	7 W at 24 Vdc (internal 5 Vdc supply fully loaded and Vloop on and boosted, fully loaded)			
Power Requirements	Typical power consumption (at 20 °C/ 68 °F)			
	SCADAPack Model	DO Relays	12 Vdc	24 Vdc
	330E	-	1.8 W	2.0 W
	334E	OFF	2.4 W	2.8 W
		ON	4.0 W	4.5 W
	337E	OFF	2.8 W	3.1 W
		ON	5.3 W	5.8 W
	SCADAPack internal 5 Vdc supply may be used to power SCADAPack options, such as I/O expansion modules through the I/O expansion bus connector			

Certifications

EMC and Radio Frequency	• ICES-003 Issue 5 August 2012 • CE and RCM markings
General Safety	UL 508
Hazardous Locations	• cCSAus Non-incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D • IECEx/ATEX Class I, Zone 2

SCADAPack 330E | 334E | 337E Specifications cont'd

Controller Board

Counter Inputs	• 1, 0...10 Hz (dry contact) • 2, 0...10 kHz (turbine or dry contact)
Internal Power Monitor	Power input - analog input and low indication, onboard lithium battery - low indication
Internal Temperature Monitor	Controller temperature range -40...+75 °C (-40...+167 °F)

Selection Guide
SCADAPack E

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SCADAPack 330E | 334E | 337E Specifications cont'd

I/O board (334E and 337E only)	
Rated Voltage	12...30 Vdc. Limit voltage: 11.5...32 Vdc; turn on voltage: 10...11.5 Vdc; turn off voltage: 9...10 Vdc
Maximum Power	7 W at 24 Vdc (internal 5 Vdc supply fully loaded and Vloop on and boosted, fully loaded)

Certifications			
	SCADAPack Model	334E	337E
	Analog Inputs	8	8
	Analog Outputs (option)	2	2
	Digital Inputs	16	32
	Digital Outputs	10	16

Analog Inputs	• Software-configurable to 0...20, 4...20 mA , 0...5 or 0...10 Vdc, plus over range • Software-configurable to 0...20, 4...20 mA , 0...5 or 0...10 Vdc, plus over range • Resolution: 15-bit ADC (15-bit over the measurement range in 10 Vdc, 14-bit in 20 mA) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0. 2% over temperature range • Input Resistance: 250 Ω or 20 kΩ in 20 mA or 10 V configurations (60 kΩ for 32.768 Vdc) • Normal rejection mode: 27 dB at 60 Hz • Sampling rate: 170 ms • Isolation: 500 Vac from logic and chassis
Analog Outputs	• 0...20/4...20 mA, voltage output may be accomplished with external precision resistor • Resolution: 12-bit over 0...20 mA range • Accuracy: ±0.15% at 25 °C (77 °F), ±0.35% of full scale over temperature range • Response Time: less than 10 µs for 10% to 90% signal change • Power Supply: 12…30 Vdc, external • Power (Current) Requirements: 10 mA plus up to 20 mA per output • Isolation: isolated from RTU logic and chassis • Load Range: 12 Vdc: 0…375 Ω, 24 Vdc: 0…925 Ω • Logic End-Of- Scan to Signal Update Latency: typically 18... 27 ms • Status & Reporting: output value • Controls: Direct Operate, Select Before Operate
Digital Inputs	• 12…24 Vdc • Turn on voltage: 9 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.67 mA at 24 Vdc • Time stamping : 170 ms • Isolation : in group of 8, 1500 Vac from logic supply and chassis

Selection Guide
SCADAPack E

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SCADAPack 330E | 334E | 337E Specifications cont'd

Certifications cont'd	
Digital Outputs	• Relays (Form A) • 4 contacts share one common • Isolation : isolated in groups of 4 (P337E) or 5 (P334E). Isolated from RTU logic, RTU chassis and other groups to 1500 Vac • Maximum Switching Voltage: 30 Vdc or 250 Vac (resistive) • Maximum Switching Load: 150 W or 1250 VA (5 A) • Controls: Direct Operate, Select Before Operate, Trip/Close, Latch, Pulse
Additional I/O	
I/O Expansion	5606, 5607 and 5304, 5404, 5411, 5414, 5415, 5505 and 5506 Maximum number of modules per unit: • SCADAPack 330E: 8 (*) • SCADAPack 334E and 337E: 7 (*) (*): to reach this limit, additional power supply modules are required

SCADAPack 330E | 334E | 337E Model Code

Code	Select: Controller
TBUP330	SCADAPack 330E, Controller 32-bit, 3 High Speed Counter Inputs
TBUP334	SCADAPack 334E, Controller 32-bit, comes with the above plus additional I/Os
TBUP337	SCADAPack 337E, Controller 32-bit, comes with the above plus additional I/Os
Code	**Select: Firmware Platform**
E	SCADAPack E Firmware (Configuration Software included), executes two IEC 61131 kernels, Workbench required
Code	**Select: SCADA Security**
A	None
B	AGA-12 Encryption for DNP3 (Security Administrator application required)
C	DNP3 Secure Authentication SAv2 (Security Administrator application required)
D	DNP3 Secure Authentication with AGA-12 (Security Administrator application required)
Code	**Select: Protocol Option**
5	DNP3 Serial/IP client/server/peer-to-peer, IEC 60870-5-101/104 Server, Modbus RTU/TCP client/server, TCP/IP
Code	**Select: License Option ***
5	IEC61131 (executes two kernels, SCADAPack Workbench required), and DF1 client

Footnotes: * Includes DNP3 Data Concentrator License (limit of 500 points from 10 IEDs) Multiple DNP3 Client License (up to 3 Clients)

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SCADAPack E

SCADAPack 330E | 334E | 337E Model Code cont'd

Code	Select: Analog Inputs
A	P334 (8) and P337 (8): selectable as 0...20 mA, 4...20 mA, 0...5 Vdc or 0...10 Vdc
Code	**Select: Digital Inputs/Outputs**
A	P330: None
B	P334: 16 inputs, 10 outputs; P337: 32 inputs, 16 outputs Inputs: 12/24 Vdc; Outputs: either Dry Contact relay (for Class I Div 2) or Solid State relay (for IECEx/ATEX)
Code	**Select: Analog Outputs**
0	None
1	P334/P337 only: 2-channel Analog Output, 0…20 mA, external DC supply
Code	**Select: Future Option**
0	None
Code	**Select: Certifications**
S	FCC, UL508, CE marking and RCM
X	Adds IECEx/ATEX Class I, Zone 2
U	Adds cCSAus Non-incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D

Notes: Accessories sold separately. This product is RoHS-compliant.

Selection Guide
SCADAPack E

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SCADAPack 350E | 357E Specifications

Controller	
Processors	• 32-bit ARM7 microcontroller, 32 MHz clock, integrated watchdog timer. • Two microcontroller IO co-processors, 20 MHz clock
Memory	• 16 MB FLASH ROM, 4 MB CMOS RAM, 4 kB EEPROM • CMOS SRAM with lithium battery retains contents for 2 years with no power
Event Logging Capacity (events)	20,000 events
Database Capacity	Up to 1,000 points
Data Concentrator Capacity (points)	Up to 500 in DNP3 or Modbus
Data Concentrator Capacity (devices)	Up to 10 in DNP3 and up to 100 in Modbus or DF1
File System Typical Storage	Internal: 6 MB
Communications	
Serial Port : COM1 Serial Port : COM2	• RS-485, 2-pole removable terminal block, 2-wire, half duplex, supports baud rates up to 115,200 bps • RS-232 port, 8-pin modular RJ45 jack, full or half duplex, or RS-485 port, 2-wire, half-duplex, supports baud rates up to 115,200 bps in RS-232 mode
Serial Port : COM3	RS-232 port, 8-pin modular RJ45 jack, full or half duplex with RTS/CTS control and operator interface power control, supports baud rates up to 115,200 bps
Serial Protocols	DNP3 level 4 client/server and peer-to-peer, IEC 60870-5-101 server, Modbus client/server, DF1 client
Ethernet Port	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100 Base-T), transformer-isolated
IP Protocol	• DNP3 level 4 in TCP client/server, UDP client/server and peer-to-peer, IEC 60870-5-104 server, Modbus/TCP Server, Modbus/ TCP Client, Modbus RTU in TCP Client • NTP Client/Server, Telnet Server, FTP Server, BOOTP Server
Client - Server Capability	• Can simultaneously report to multiple independent active clients: 3 in DNP3, 2 in IEC 60870-5-101/-104, 5 in Modbus TCP and 3 in Modbus RTU, and connect to up to 100 remote devices in DNP3 peer-to-peer • As a data concentrator it can manage up to 10 local or remote DNP3 servers, and up to 10 local servers communicating with Modbus RTU, Modbus TCP or DF1 serial
USB Device	USB 2.0-compliant “B”-type receptacle, for local configuration

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SCADAPack 350E | 357E Specifications cont'd

General	
Logic Control	IEC 61131-3 SCADAPack Workbench programming suite (LD, ST, FBD & SFC)
I/O Terminations	• SCADAPack 350E: 6, 12-pole connector, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded • SCADAPack 357E: 5, 6, 7, 9, 10, 12-pole connectors, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded
Dimensions	• SCADAPack 350E: 211.8 mm wide x 140.4 mm high x 46.5 mm deep (8.34 in. x 5.53 in. x 1.83 in.) • SCADAPack 357E: 211.8 mm wide x 181.0 mm high x 66.0 mm deep (8.34 in. x 7.13 in. x 2.60 in.)
Enclosure	Corrosion-resistant zinc-plated steel with black enamel paint
Environment	• Conformal coated • -40...+70 °C (-40...+158 °F) operating, -40...+85 °C (-40...+185 °F) storage • 5% RH to 95% RH, non-condensing
Shock & Vibration	IEC 60068-2-27 (tested up to 15 g), IEC 60068-2-6
Power	
Rated Voltage	12...30 Vdc. Limit voltage: 11.5...32 Vdc; turn on voltage: 10...11.5 Vdc; turn off voltage: 9...10 Vdc
Maximum Power	12 W at 24 Vdc (internal 5 Vdc supply fully loaded and Vloop on and boosted, fully loaded)
Power Requirements	• SCADAPack 350E typical power consumption (at 20 °C/ 68 °F)

	Controller LEDs	Vloop Fully Loaded	12 Vdc	24 Vdc
Use Case 1	OFF		1.6 W	1.5 W
Use Case 2	OFF	ON	5.1 W	4.9 W
Use Case 3	ON		5.2 W	5.0 W

	• SCADAPack 357E typical power consumption: up to 8.9 W (with up to 7 analog input/output loops powered from Vloop supply)
Power Outputs	Vloop • Maximum 140 mA at 12 Vdc (booster turned off) or 24 Vdc (booster turned on); can power up to 7 analog input/output loops
Controller Board	
Analog Inputs	5, user-selectable 0...10 Vdc or 0...20 mA plus over range 1, 0...32.7 Vdc (15-bit) for DC supply monitoring • Resolution: 15-bit ADC (15-bit over the measurement range in 10 Vdc, 14-bit in 20 mA) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0.2% over temperature range • Input Resistance: 250 Ω or 20 kΩ in 20 mA or 10 Vdc configurations (60 kΩ for 32.768 V) • Normal rejection mode: 27 dB at 60 Hz • Sampling rate: 170 ms

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SCADAPack 350E | 357E Specifications cont'd

Controller Board cont'd	
Analog Outputs	2 (optional), 0...20 mA, 4...20 mA, voltage output may be accomplished with external precision resistor • Resolution: 12-bit over 0...20 mA range • Accuracy: ±0.15% at 25 °C (77 °F), ±0.35% of full scale over temperature range • Response Time: less than 10 µs for 10% to 90% signal change • Power Supply: 12…30 Vdc, external • Power (Current) Requirements: 10 mA plus up to 20 mA per output • Isolation: isolated from RTU logic and chassis • Load Range: 12 Vdc: 0…375Ω, 24 Vdc: 0…925 Ω • Logic End-Of- Scan to Signal Update Latency: typically 18... 27 ms • Status & Reporting: output value • Controls: Direct Operate, Select Before Operate
Digital Inputs/Outputs	8, user-selectable as inputs or outputs (open drain) As Digital Inputs • Dry contact • Time stamping: 170 ms As Digital Outputs • Sinking MOSFET output, rated 30 V, 0.5 A, ground return connected to Chassis Ground
Counter Inputs	• 1, 0...10 Hz (dry contact)
Internal Power Monitor	• 2, 0...10 kHz (turbine or dry contact)
Internal Temperature Monitor	Controller temperature range -40...+75 °C (-40...+167 °F)
I/O Board (357E only)	
Analog Inputs	8, software-configurable to 0...20, 4...20 mA , 0...5 or 0...10 Vdc Same features as for the 5 analog inputs located on the controller board (see above) except isolation: • Isolation: 500 Vac from logic and chassis
Analog Outputs	2 (optional), 0...20/4...20 mA, voltage output may be accomplished with external precision resistor, same features as for the analog outputs located on the controller board
Digital Inputs	32, 12…24 Vdc • Turn on voltage: 9 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.67 mA at 24 Vdc • Time-stamping : 170 ms • Isolation: in group of 8, 1500 Vac from logic supply and chassis
Digital Outputs	16, relays (Form A) • 4 contacts share one common • Isolation : isolated in groups of 4. Isolated from RTU logic, RTU chassis and other groups to 1500 Vac • Maximum Switching Voltage: 30 Vdc or 250 Vac (resistive) • Maximum Switching Load: 150 W or 1250 VA (5 A) • Controls: Direct Operate, Select Before Operate, Trip/Close, Latch, Pulse
Additional I/O	
I/O Expansion	Supported modules: 5606, 5607, 5304, 5404, 5411, 5414, 5415, 5505 and 5506 Maximum number of modules per unit: SCADAPack 350E: 8 (*) SCADAPack 357E: 7 (*) (*): to reach this limit, additional power supply modules are required

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SCADAPack 350E | 357E Model Code

Code	Select: Controller
TBUP350	350E, Controller 32-bit, 5 Analog Inputs, 8 Digital I/O, 3 High Speed Counter Inputs
TBUP357	357E, Controller 32-bit, comes with the above plus additional I/Os
Code	**Select: Firmware Platform**
E	SCADAPack E Firmware (Configuration Software included), executes two IEC 61131 kernels, Workbench required
Code	**Select: SCADA Security**
A	None
B	AGA-12 Encryption for DNP3 (Security Administrator application required)
C	DNP3 Secure Authentication SAv2 (Security Administrator application required)
D	DNP3 Secure Authentication with AGA-12 (Security Administrator application required)
Code	**Select: Protocol Option**
5	DNP3 Serial/IP client/server/peer-to-peer, IEC 60870-5-101/104 server, Modbus RTU/TCP client/server, TCP/IP, DF1 client
Code	**Select: License Option**
5	DNP3 Data Concentrator License (limit of 500 points from 10 IEDs), supports multiple DNP3 Clients (up to 3)
Code	**Select: Analog Inputs**
A	• P350 : 5 selectable as 0...10 Vdc or 0...20 mA • P357 : adds 8 selectable as 0...2 0mA, 4...20 mA, 0...5 Vdc or 0...10
Code	**Select: Digital Inputs/Outputs**
A	P350 only: 8 Digital I/O, individually selectable as digital input (Dry Contact) or digital output (Open Drain)
B	P357 only: adds 32 digital inputs (12...24 Vdc), 16 digital outputs (Dry Contact relay for Class I Div 2, Solid State relay for IECEx/ATEX)
Code	**Select: Analog Outputs**
0	None
1	2 channel Analog Output, 0..20 mA, external DC supply
2	P357 only: 4 channel Analog Output, 0..20 mA, external DC supply

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SCADAPack E

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SCADAPack 350E | 357E Model Code cont'd

Code	Select : Future Options
0	None
Code	**Select: Certifications**
S	With FCC, UL508, CE marking and RCM
X	Adds IECEx/ATEX Class I, Zone 2
U	Adds cCSAus Nonincendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D

Notes: Accessories sold separately. This product is RoHS-compliant.

Selection Guide
SCADAPack E

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SCADAPack 530E | 535E Specifications

Controller	
Processor	SPEAr 1380 32-bit dual-core Cortex A9 microcontroller, up to 600 MHz
Memory	• 128 MB NAND FLASH, 128 MB DDR3 RAM • Non-Volatile RAM CMOS SRAM with lithium battery retains contents for 2 years with no power
Event Logging Capacity (events)	40,000 (this number decreases if the database is greater than 10,000 points)
Database Capacity (points)	Up to 20,000 (this number decreases if the event pool is above 7,000 events)
Data Concentrator Capacity (points)	Approximately 15,000
Data Concentrator Capacity (devices)	Approximately 100
File System Typical Storage	Internal: 10 MB; External: 32 GB (on optional memory stick)
Communications	
Serial Ports: Serial1, Serial2	RS-232 port, 8-pin modular RJ45 jack, full or half duplex with RTS/CTS control and operator interface power control, supports baud rates up to 115,200 bps. Rated to ±15 kV (IEC 61000-4-2, Air Discharge) static protection
Serial Ports: Serial3, Serial4	• RS-232 port, 8-pin modular RJ45 jack, full or half duplex, or RS-485 port, 2-wire, half-duplex, supports baud rates up to 115,200 bps • In RS-232 mode, rated to ±15 kV (IEC 61000-4-2, Air Discharge) static protection
Embedded Wireless	• The controller board is fitted with Socket Modem support, for future use
Serial Protocols	DNP3 level 4 server/client and peer-to-peer, IEC 60870-5-101 server, Modbus server/client, DF1 client
Ethernet Ports: Eth1, Eth2, Eth3	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100 Base-T), transformer-isolated
IP Protocols	• DNP3 level 4 in TCP Client/Server, UDP Client/Server and peer-to-peer, IEC 60870-5-104 Server, Modbus/TCP Server, Modbus/ TCP Client, Modbus RTU in TCP Client • NTP Client/Server, Telnet Server, FTP Server, BOOTP Serve
Client - Server Capability	• Can simultaneously report to up to 29 independent clients (3 in DNP3, 2 in IEC 60870-5-5-101/104, 20 in Modbus TCP and 4 in Modbus RTU) and connect to up to 100 remote devices in DNP3 peer-to-peer • As a data concentrator it can manage up to 100 local or remote DNP3 servers, and up to 100 local servers communicating with Modbus RTU, Modbus TCP or DF1 serial
USB Device	USB 2.0-compliant “B”-type receptacle, for local configuration
USB Host	USB 2.0-compliant “A”-type receptacle, supports USB devices up to 32GB (specific memory sticks supported)

Selection Guide
SCADAPack E

Green Premium™ Product

SCADAPack 530E | 535E Specifications cont'd

General	
Logic Control	IEC 61131-3 SCADAPack Workbench programming suite (LD, ST, FBD & SFC)
I/O Terminations	• SCADAPack 530E: 11-pole connector, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded • SCADAPack 535E: 5, 6, 7, 9, 11-pole connectors, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded
Dimensions	• SCADAPack 530E: 150.5 mm wide x 134.8 mm high x 74.9 mm deep (5.93 in. x 5.31 in. x 2.95 in.) • SCADAPack 535E: 150.5 mm wide x 182.3 mm high x 86.5 mm deep (5.93 in. x 7.18 in. x 3.41 in.)
Packaging	Corrosion-resistant zinc-plated steel with black enamel paint
Environment	• -40...+70 °C (-40...+158 °F) operating, -40...+85 °C (-40...+185 °F) storage • 5% RH to 95% RH, non-condensing
Shock & Vibration	IEC 60068-2-27 (tested up to 15 g), IEC 60068-2-6

Power	
Rated Voltage	12...30 Vdc, 5 W typical. Limit voltage: 11.5...32 Vdc; turn on voltage: 10...11.5 Vdc; turn off voltage: 9...10 Vdc
Maximum Power	SP530E + 4 x 6601 expansion IO modules + USB: 8.7 W
Power Requirements	SP530E (Controller) 3.7 W SP535E (Controller with integrated IO) 4.8 W 6601 (Expansion IO) 1.1 W USB (5 Vdc at 100mA) 0.6 W Serial port (5 V at 250mA) 1.5 W For analog output power requirements see the Analog Output specifications

Power Consumption (W)

Voltage Input Vdc	530E	535E	535E + 6601	535E + 2 x 6601	535E + 3 x 6601
11.5	3.0	4.1	5.2	6.3	7.4
13.8	3.0	4.1	5.2	6.3	7.4
24	3.4	4.5	5.6	6.7	7.8
30	3.7	4.8	5.9	7.0	8.1

Certifications	
EMC & Radio Frequency	• FCC 47 CFR Part 15, Subpart B • ICES-003 Issue 5 August 2012 • CE and RCM markings
General Safety	UL 508
Hazardous Locations	• cCSAus Non incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D • IECEx/ATEX Class I, Zone 2

Selection Guide
SCADAPack E

Green Premium™ Product

SCADAPack 530E | 535E Specifications cont'd

Controller board (530E and 535E)	
Digital Inputs	2, 12…24 Vdc • Turn on voltage: 8 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.4 mA at 12 Vdc, 0.8 mA at 24 Vdc • Time stamping: 10 ms • Ground return connected to Chassis Ground
Digital Output	1, Sinking MOSFET output, rated 30 V, 0.5 A, ground return connected to Chassis Ground
Internal Power Monitor	Power input - analog input and low indication, onboard lithium battery -
Internal Temperature Monitor	Controller temperature range -40...+75 °C (-40...+167 °F)
I/O board (535E and 6601 standalone module)	
Analog Inputs	6, dipswitch-configurable to 4...20 mA, 0...20 mA, 1...5 V, or 0...5 V • Uni-polar, differential, voltage or current • Resolution: 24-bit ADC (16-bit over the measurement range) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0.2% over temperature range • Isolation: 250 Vac isolation from channel to channel and from rPAC logic and chassis • Input Resistance: 250 Ω or 800 kΩ in current/voltage configurations • Under range: 4...20 mA measures to 0 mA • Common Mode Rejection: -80 dB (50/60 Hz) • 30 ms sampling rate
Analog Outputs	2 (optional), 0...20 mA, 4...20 mA, voltage output may be accomplished with external precision resistor • Uni-polar • Resolution: 12-bit over 0...20 mA range • Accuracy: ±0.15% at 25 °C, ±0.35% of full scale over temperature range • Response Time: less than 10 µs for 10% to 90% signal change • Power Supply: 12…30 Vdc, external • Power (Current) Requirements: 10 mA plus up to 20 mA per output • Isolation: transformer, 500 Vdc maximum to RTU logic and chassis • Load Range: 12 Vdc: 0…475Ω, 24 Vdc: 0…1075 Ω, 30 Vdc: 250…1375 Ω • Logic End-Of- Scan to Signal Update Latency: less than 10 ms (typically 5...8 ms) • Status & Reporting: Open Loop status, output value poll • Controls: Direct Operate, Select Before Operate
Digital Inputs	16, 12…24 Vdc • Turn on voltage: 9 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.9…1.2 mA at 12 Vdc, 2.1…2.4 mA at 24 Vdc • Time stamping: 1 ms Sequence of Event • Isolation: in 2 groups of 8. Isolation from RTU logic and chassis: 1000 Vac/1500 Vdc

Selection Guide
SCADAPack E

Green Premium™ Product

SCADAPack 530E | 535E Specifications cont'd

I/O board (535E and 6601 standalone module) cont'd	
Digital Outputs	8, relays (2 Form C, 6 Form A) • Form C: SPDT, separate Normally Open/Normally Closed/Common • Form A: Normally open, one common • Isolation: 500 Vac minimum to RTU logic • Maximum Switching Voltage: 30 Vdc or 25 Vac • Maximum Switching Load: 60 W or 50 VA (2A) • Status & Reporting: Individual relay pole feedback to software, output state poll • Controls: Direct Operate, Select Before Operate, Trip/Close, Latch, Pulse
Counter Inputs	8, shared with digital input channels 1 to 4: 0…1.5 kHz, 5 to 8: 0…150 Hz
Additional I/O	
I/O Expansion	Supported modules: • 5304, 5405, 5414, 5415, 5506, 5606, 5607, 6601 Maximum number of modules per unit: • SCADAPack 530E: 16* • SCADAPack 535E: 15* Footnote: * to reach this limit, additional power supply modules are required

Selection Guide
SCADAPack E

Green Premium™ Product

SCADAPack 530E | 535E Model Code

Code	Select: Controller
TBUP530	SCADAPack 530E, 32-bit controller, Dual Core
TBUP535	SCADAPack 535E, 32-bit controller, Dual Core, comes with additional I/O
Code	**Select: Firmware Platform**
E	E SCADAPack E Firmware (Configuration Software included), executes two IEC 61131 kernels, Workbench required
Code	**Select: SCADA Security**
A	None
B	AGA-12 Encryption for DNP3 (Security Administrator application required)
C	DNP3 Secure Authentication SAv2 (Security Administrator application required)
D	DNP3 Secure Authentication with AGA-12 (Security Administrator application required)
Code	**Select: Protocol Option**
5	DNP3 Serial/IP mstr/server/peer-to-peer, IEC 60870-5-101/104 Server, Modbus RTU/TCP mstr/server, TCP/IP, DF1 mstr
Code	**Select: License Option**
6	Full DNP3 Data Concentrator License, Multiple DNP3 Client License (up to 3 Clients)
Code	**Select: Analog Inputs**
A	P530: None P535: adds 6, shipped selectable as 0...20 mA or 4...20 mA
B	P535 only: adds 6, shipped selectable as 0...5 Vdc or 1...5 Vdc
Code	**Select: Digital Inputs/Outputs**
A	P530: 2 Digital Inputs (12/24 Vdc), 1 Digital Output (open collector)
B	P535: 16 Digital Inputs (12/24 Vdc) and 8 Dry Contact Relay outputs (6 Form A, 2 Form C)
Code	**Select: Analog Outputs**
0	None
1	P535 only: 2 channel Analog Output option, shipped selectable as 0...20 mA or 4...20 mA, external DC supply
Code	**Select : Integrated Communications Interfaces**
0	None
Code	**Selection: Certifications**
S	With FCC, UL508, CE marking and RCM
X	Adds IECEx/ATEX Class I, Zone 2
U	Adds cCSAus Nonincendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D

Selection Guide
SCADAPack E

Green Premium™ Product

I/O Expansion Modules (Supported by SCADAPack 530E & 535E Controllers only) Model Codes

Part No.	I/O Expansion Modules (complete the following part numbers with S, U or X depending on certification required)
TBUX297583___	Model 6601-20 mA, 16 D/I 12...24 Vdc, 8 Dry Contact relay O/P, 6 config. A/I (0/4...20 mA)
TBUX297584___	Model 6601-5 V, 16 D/I 12...24 Vdc, 8 Dry Contact relay O/P, 6 config. A/I (0/1...5 Vdc)
TBUX297585___	Model 6601-20 mA, 16 D/I 12...24 Vdc, 8 Dry Contact relay O/P, 6 config. A/I (0/4...20 mA), 2 A/O (external DC supply)
TBUX297586___	Model 6601-5 V, 16 D/I 12...24 Vdc, 8 Dry Contact relay O/P, 6 config. A/I (0/1...5 Vdc), 2 A/O (external DC supply)

I/O expansion and distributed architecture

1. Depending on the options chosen (with or without the future socket modem), SCADAPack 535E embedded DC supply can power either two (2) or four (4) 6601 IO expansion modules. When more 6601 IO expansion modules are required in any of these two configurations, then it is necessary to use one of our power supply extensions (one unit can power up to 8x 6601 modules).

2. SCADAPack 535E can be used as a Remote I/O client, managing up to 15 SCADAPack ES server units: SCADAPack 535E automatically downloads the corresponding configuration into these server devices (which is very useful when replacing devices, as the operator does not have to do any firmware setting).

Notes: Accessories sold separately. This product is RoHS-compliant.

Selection Guide
I/O Expansion Modules

5103 Uninterruptible Power Supply Specifications

General	
AC/DC Input	• 16...24 Vac for 5/24 Vdc outputs operational, 24 Vac required for battery charging • 14.5+/-0.5 Vdc for 5/24 Vdc outputs operational, 20 Vdc required for battery charging
DC/Battery Input	Turn on at 11.5 Vdc ± 0.3 Vdc, Turn off at 10.5 Vdc ± 0.5 Vdc, Maximum input is 36 Vdc
Input Power	35 VA maximum at 24 Vac, 1.9 A at 13.5 Vdc
Outputs	5 Vdc at 2.0 A, 24 Vdc at 0.5 A, 17 W total available from the two outputs 11...14 Vdc battery charger at 200 mA (factory adjusted to 13.5 Vdc for gelled electrolyte lead/acid battery)
Mode	Isolated switch-mode, 30 KHz switch frequency
Line Regulation	< 1% over operating range
Load Regulation	• 5 Vdc output: 5.15 Vdc ±1% over operating range • 24 Vdc output: ±17%
Output Ripple	• 5 Vdc output: < 10 mV at 20 °C (68 °F) • 24 Vdc output: < 50 mV at 20 °C (68 °F)
Visual Indicators	5 Vdc and 24 Vdc green LEDs show power status
Power Requirements	35 VA maximum @ 24 Vac, 1.9 A @ 13.5 Vdc
Terminations	10-pole, removable terminal block, 12...22 AWG, 15 amp contacts
Dimensions	108 mm wide x 118 mm high x 44 mm deep (4.25 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	• 5% RH to 95% RH, non-condensing • -40...+60 °C (-40...+140 °F)
Safety	Non-Incendive Electrical Equipment for Use in Class I, Division 2 Groups A, B, C and D Hazardous Locations. Temperature Code T4 at 60 °C ambient. UL Listed to the following standards: • CSA Std. C22.2 No. 213-M1987 - Hazardous Locations • CSA Std. C22.2 No. 142-M1987 - Process Control Equipment • UL Std. No. 1604 - Hazardous (Classified) Locations • UL Std. No. 508 - Industrial Control Equipment

5103 Uninterruptible Power Supply Model Code

Part Number	Model	Description
TBUX297102	5103	SCADAPack Uninterruptible power supply

Accessories

Part Number	Model	Description
TBUX294034	1206	12 Vdc 6 AH gelled electrolyte battery
TBUX294000	ACX-24	120/24 Vac, 40 VA transformer
TBUX294167	ACX-24E	220/24 Vac, 40 VA transformer

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5304 Analog Output Module Specifications

General	
Output Points	4
Output Modes	Current mode, jumper link selectable
Output Signal Ranges	0...20 mA or 4...20 mA, switch-configurable
Output Type	Single-ended regulation on positive side with common negative return
Maximum Load Resistance	1000 Ω with 24 Vdc loop power, 400 Ω with 12 Vdc loop power, 250 Ω with 9 Vdc loop power
Minimum Load Resistance in Voltage Mode	• 2 kΩ for 10 Vdc full scale, with min 20 Vdc power applied • 1 kΩ for 5 Vdc full scale, with min 15 Vdc power applied
Isolation	500 Vac field to logic
D/A Resolution	12-bit over the 0...20 mA range
Absolute Accuracy	+/- 0.05% of full scale at 25 ºC (77 ºF), +/- 0.2% of full scale over temperature range
Noise and Ripple	0.04% maximum
Transient Protection	• 2.5 kV surge withstand capability as per ANSI/IEEE C37.90.1-1989 • Inductive load protection diodes included
Response Time	2 ms typical to 90% signal change
Addressing	DIP switch-configurable
12...24 Vdc Operating Voltage Limits	9 Vdc or (20 mA x load resistance) +4 Vdc (whichever is greater) in current mode
Power Requirements	• 6 mA min., 25 mA maximum • 15 mA quiescent plus 80 mA max. in current mode
Terminations	10-pole, removable terminal block, 12 to 22 AWG, 15 A contacts
Dimensions	108 mm wide x 118 mm high x 44 mm deep (4.25 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing; -40...70 °C (-40...158 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5304 Analog Output Module Model Code

Part Number	Model	Description
TBUX297248	5304-20	4-channel isolated analog output module, 0.20 mA
TBUX297254	5304-C	4-channel isolated analog output module, Custom (specify range of each input)

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5401 Configurable Digital I/O Module Specifications

General	
Number of Inputs or Outputs	8
Voltage Range	See relay specifications below
Load Current	See relay specifications below
Surge Current	See relay specifications below
Off-State Leakage	See relay specifications below
Transient Protection	Integral to the solid-state relay
Response Time	See relay specifications below
Isolation	1500 Vac
Addressing	DIP switch-configurable
Input/Output Assignment	DIP switch selection for each I/O point
Power Requirements	5 Vdc @ 90 mA
Visual Indicators	8: LEDs
Field Terminations	2: 8-pole, removable terminal block, 12...22 AWG, 15 A contacts
Dimensions	108 mm wide x 118 mm high x 44 mm deep (4.25 in. x 4.625 in. x 1.75 in.)l
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5401 Configurable Digital I/O Module Model Code

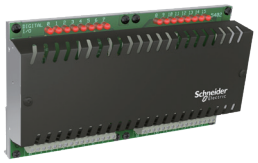
Part Number	Model	Solid-State Relays for use with Model 5401
TBUM297122	IACM-5	90...140 Vac/Vdc input relay
TBUM297132	IACM-5A	180...280 Vac/Vdc input relay
TBUM297133	IACM-5E	10...32 Vdc, 15...32 Vac, no polarity
TBUM297124	IDCM-5	3...32 Vdc input relay
TBUM297123	OACM-5	24...140 Vac output relay, 3 A
TBUM297134	OACM-5H	24...280 Vac output relay, 5 A
TBUM297125	ODCM-5	3...60 Vdc output relay, 3 A
TBUM297135	ODCM-5A	10...200 Vdc, 1 A

Part Number	Model	Description
TBUX297121	5401	8-point input or output module (requires solid-state relays)

Notes: Accessories sold separately. This product is not RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules



5402 Configurable Digital I/O Module Specifications

General	
Number of Inputs or Outputs	16
Voltage Range	See relay specifications below
Load Current	See relay specifications below
Surge Current	See relay specifications below
Off-State Leakage	See relay specifications below
Transient Protection	Integral to the solid-state relay
Response Time	See relay specifications below
Isolation	1500 Vac
Addressing	DIP switch-configurable
Input/Output Assignment	DIP switch selection for each I/O point
Power Requirements	5 Vdc @ 150 mA
Visual Indicators	16: LEDs
Field Terminations	4: 8-pole, removable terminal block, 12...22 AWG, 15 A contacts
Dimensions	215 mm wide x 118 mm high x 44 mm deep (8.37 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	Class 1, Division 2 for use in hazardous locations

5402 Configurable Digital I/O Module Model Code

Part Number	Model	Solid-State Relays for use with Model 5402
TBUM297122	IACM-5	90...140 Vac/Vdc input relay
TBUM297132	IACM-5A	180...280 Vac/Vdc input relay
TBUM297133	IACM-5E	10...32 Vdc, 15...32 Vac, no polarity
TBUM297124	IDCM-5	3...32 Vdc input relay
TBUM297123	OACM-5	24...140 Vac output relay, 3 A
TBUM297134	OACM-5H	24...280 Vac output relay, 5 A
TBUM297125	ODCM-5	3...60 Vdc output relay, 3 A
TBUM297135	ODCM-5A	10...200 Vdc, 1 A
Part Number	**Model**	**Description**
TBUX297153	5402	16-point input or output module (requires solid-state relays)

Notes: Accessories sold separately. This product is not RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5403 High Level Digital Input Module Specifications

General	
Number of Inputs or Outputs	8
Voltage Range	OFF to ON transition threshold is typically 50% of full scale signal range
Over-Voltage Tolerance	150% sustained over-voltage without damage
Input Current	5 mA typical
Response Time	• OFF to ON: 7 ms typical • ON to OFF: 24 ms typical
Isolation	1500 Vac in groups of 4 inputs
Addressing	DIP switch-configurable
Power Requirements	5 Vdc @ 45 mA all LEDs ON, 5 Vdc @ 25 mA with LEDs disabled
Visual Indicators	8: LEDs controlled for power reduction
Field Terminations	• 1: 10-pole, removable terminal block • 12...2 AWG • 15 A contacts
Dimensions	108 mm wide x 118 mm high x 44 mm deep (4.25 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5403 High Level Digital Input Module Model Code

Part Number	Model	Signal Range
TBUX297110	5403-12	12 Vac, Vdc
TBUX297109	5403-24	24 Vac, Vdc
TBUX297106	5403-240	240 Vac, Vdc

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5404 High Level Digital Input Module Specifications

General	
Number of Inputs or Outputs	16
Voltage Range	OFF to ON transition threshold is typically 50% of full scale signal range
Over-Voltage Tolerance	150% sustained over-voltage without damage
Input Current	5 mA typical
Response Time	• OFF to ON: 7 ms typical • ON to OFF: 24 ms typical
Isolation	1500 Vac in groups of 4 inputs
Addressing	DIP switch-configurable
Power Requirements	5 Vdc @ 80 mA all LEDs ON, 5 Vdc @ 25 mA with LEDs disabled
Visual Indicators	16: red LEDs controlled for power reduction
Field Terminations	• 2: 10-pole, removable terminal block • 12...2 AWG • 15 A contacts
Dimensions	144 mm wide x 118 mm high x 44 mm deep (5.65 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5404 High Level Digital Input Module Model Code

Part Number	Model	Signal Range
TBUX297156	5404-48	48 Vac, Vdc
TBUX297154	5404-240	240 Vac, Vdc

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5405 Digital Input Module Specifications

General	
Number of Inputs or Outputs	32
Ranges	12...24 Vdc, 16...24 Vac, 120 Vac/Vdc
Over-Voltage Tolerance	150% sustained over-voltage without damage
Input Current	• 6.0 mA typical @ 24 Vdc on the 24 Vdc range • 3.5 mA typical @ 24 Vac on the 24 Vac range • 2.5 mA typical @ 120 Vdc on the 120 Vdc range • 1.5 mA typical @ 120 Vac on the 120 Vac range
DC Input Logic Levels	• OFF to ON transition threshold is typically 7.5 Vdc on the 24 Vdc range • OFF to ON transition threshold is typically 55 Vdc on the 120 Vdc range
AC Input Levels	• OFF to ON transition threshold is typically 6 Vac on the 24 Vac range • OFF to ON transition threshold is typically 45 Vac on the 120 Vac range
Transient Protection	2.5 kV surge withstand capability as per ANSI/IEEE C37.90.1-1989
Isolation	• Isolated in 4 groups of 8. Inputs 0...15 are on the bottom edge • Inputs 16...31 are on the top edge. Isolation 500 Vac/Vdc from chassis and logic ground
Power Requirements	5 Vdc @ 10 mA with all inputs ON
Terminations	4: 9-pole, removable terminal blocks, 12 to 22 AWG, 15 A contacts
Dimensions	144 mm wide x 127 mm high x 45 mm deep (5.65 in. x 5.00 in. x 1.88 in.)
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Addressing	Configurable with 4 DIP switches
AC/DC Operation	2: DIP switches determine AC/DC and 50/60 Hz operation
Visual Indicators	32: Red LED's, field powered. Cannot be disabled to conserve power
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5405 Digital Input Module Model Code

Part Number	Model	Description
TBUX297249	5405-120	32-point, 120 Vac discrete input module
TBUX297247	5405-24	32-point, 12...24 Vdc discrete input module

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5406A Dry Contact Relay Output Module Specifications

General	
Number of Relay Outputs	16
Type	Sealed mechanical relay, Form A (normally open) contacts
Contact Ratings	• 6A @ 250 Vac resistive loads, 6A @ 30 Vdc resistive loads • 3.5 A at 30 Vdc/250 Vac inductive load (pf=0.4. L/R=7 ms), 1/4 HP 125 Vac • 3 A maximum in Class 1, Division 2 hazardous locations
Operating Frequency	18,000 operations/hour mechanically, 1,800 electrically at rated load
Service Life	• 1,500,000 operations at 0...250 mA loads, 600,000 operations at 1A resistive load • 100,000 operations at 6 A resistive load, 300,000 operations at 1A inductive loads (pf=0.4) • 100,000 operations at 3.5 A inductive loads (pf=0.4)
Operate Time	10 mS maximum, 5 mS typical
Release Time	10 mS maximum, 2 mS typical
Bounce Time	3 mS typical
Contact Isolation	1000 Vac
Logic Isolation	1500 Vac
Addressing	DIP switch-configurable
Power Requirements	• 5 Vdc Bus Power - 5 Vdc @ 600 mA with all LEDs and all relays energized • External Power - 5 Vdc @ 65 mA with all LEDs and all relays energized
Visual Indicators	16: LEDs, controlled for power reduction
Field Terminations	• 4: 8-pole, removable terminal block, 12...22 AWG, 15 A contacts • Additional three pins on connector P3 to support external power
Dimensions	215 mm wide x 118 mm high x 44 mm deep (8.37 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5406A Dry Contact Relay Output Module Model Code

Part Number	Model	Description
TBUX297284	5406A	16-point dry contact relay output module

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5407 Dry Contact Relay Output Module Specifications

General	
Number of Relay Outputs	8
Type	• Sealed mechanical relay, Form A (normally open) contacts • Can be modified for Form B contacts
Contact Ratings	• 6 A @ 250 Vac resistive loads, 6 A @ 30 Vdc resistive loads • 3.5 A at 30 Vdc/250 Vac inductive load (pf=0.4. L/R=7 ms), 1/4 HP 125 Vac • 3 A maximum in Class 1, Division 2 hazardous locations
Operating Frequency	18,000 operations/hour mechanically, 1,800 electrically at rated load
Service Life	• 1,500,000 operations at 0...250 mA loads, 600,000 operations at 1A resistive load • 100,000 operations at 6 A resistive load, 300,000 operations at 1A inductive loads (pf=0.4) • 100,000 operations at 3.5 A inductive loads (pf=0.4)
Operate Time	10 mS maximum, 5 mS typical
Release Time	10 mS maximum, 2 mS typical
Bounce Time	3 mS typical
Contact Isolation	1000 Vac
Logic Isolation	1500 Vac
Addressing	DIP switch-configurable
Power Requirements	5 Vdc @ 300 mA all LEDs and all relays energized
Visual Indicators	8: LEDs, controlled for power reduction
Field Terminations	2: 8-pole, removable terminal block, 12...22 AWG, 15 A contacts
Dimensions	108 mm wide x 118 mm high x 44 mm deep (4.25 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5407 Dry Contact Relay Output Module Model Code

Part Number	Model	Description
TBUX297126	5407	8-point dry contact relay output module

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5409 FET Digital Output Module Specifications

General	
Output Points	8
Output Voltage Range	12...24 Vdc
Load Current	2 A continuous per output, 10 A total
Surge Current	8 A for 2 ms
MOSFET Rating	50 Vc, 12 A
ON-State Voltage	Drop 0.5 Vdc maximum at 2 A
OFF-State Leakage	<1 uA at 24 Vdc, 25 °C
Transient Protection	Inductive load protection diodes included
Snubber	RC snubber on each output allows inductive loads
Transient Protection	1/2 AC cycle maximum, 8.3 ms @ 60 Hz
Isolation	1500 Vac
Addressing	DIP switch-configurable
Power Requirements	• 5 Vdc @ 120 mA with all LEDs and outputs turned on • 5 Vdc @ 80 mA with LEDs disabled and all outputs turned on
Visual Indicators	• 8: red LEDs controlled for power reduction • 1: green field power LED
Field Terminations	10-pole, removable terminal block, 12...22 AWG, 15 A contacts
Dimensions	108 mm wide x 118 mm high x 44 mm deep (4.25 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	Class 1, Division 2 for use in hazardous locations

5409 FET Digital Output Module Model Code

Part Number	Model	Description
TBUX297117	5409	8-point FET digital output module

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5410 High Speed Counter/Accumulator Module Specifications

General	
Counter Input Points	4
Count Length	32-bit, range is 0...4,294,967,295
Over-Voltage Protection	Transient suppressor on each input
Input Voltage Range	Typical operating inputs 5...24 Vdc, 3 Vdc minimum, 28 Vdc maximum
Input Current	8 mA typical, 13 mA maximum
Input Logic Level	OFF to ON threshold is typically 2 Vdc
Maximum Input Frequency	10 kHz with filters off, 5 kHz with quadrature counters, 60 Hz with de-bounce filters on
Maximum Pulse High Width	• 50 microseconds (µs), 100µs with quadrature counters • 8.3 milliseconds with de-bounce filtersMaximum Pulse Low Width
Maximum Pulse Low Width	• 50 microseconds (µs), 100µs with quadrature counters • 8.3 milliseconds with de-bounce filters
Isolation	1500 Vac input to input, 500 Vac input to logic circuit
Addressing	DIP switch-configurable
Power Requirements	• 5 Vdc @ 120 mA with all LEDs and outputs turned on • 5 Vdc @ 80 mA with LEDs disabled and all outputs turned on
Visual Indicators	• 4: red LEDs • LED on time stretched for easy viewing controlled for power reduction
Field Terminations	8-pole, removable terminal block, 12...22 AWG, 15 A contacts
Dimensions	108 mm wide x 118 mm high x 44 mm deep (4.25 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, –40...60 °C or (–40...140 °F)
Safety	Class 1, Division 2 for use in hazardous locations

5410 High Speed Counter/Accumulator Module Model Code

Part Number	Model	Description
TBUX297149	5410	4-point high speed counter /accumulator module

Notes: Accessories sold separately. This product is not RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5411 Digital Output Module Specifications

General	
Output Points	32
Output Rating	• 1.0 A maximum • 0.35 Vdc maximum drop at 1.0 A • 0.05 Vdc maximum drop at 0.1 A
Transient Protection	• 2.5 kV surge withstand capability as per ANSI/IEEE C37.90.1-1989 • Inductive load protection diodes included
Isolation	• Isolated in 2 groups of 16 • Isolation 500 Vac/Vdc from chassis and logic ground
Power Requirements	• 5 Vdc @ 150 mA with all LEDs and outputs turned on • 5 Vdc @ 40 mA with all LEDs disabled and all outputs turned on • 24 Vdc @ 5 mA with all outputs ON • 8 Vdc min., 30 Vdc max
Visual Indicators	32: Red LEDs, can be disabled to conserve power
Field Terminations	• 2: 9 and two 10-pole, removable terminal blocks • 12...22 AWG, 15 A contacts
Dimensions	144 mm wide x 127 mm high x 45 mm deep (5.65 in. x 5.00 in. x 1.80 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing; -40...70 °C (-40...158 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5411 Digital Output Module Model Code

Part Number	Model	Description
TBUX297246	5411	32-point digital output module

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5414 Compact Digital Input Module Specifications

General	
Number of Digital Inputs	16
Ranges	Factory configurable as: 12/24 Vdc
Input Current	• 0.6 – 0.9 mA at 24 Vdc on the 12/24 Vdc range • 0.3 – 0.4 mA at 48 Vdc on the 48 Vdc range • 0.3 – 0.4 mA at 120 Vac on the 115/125 Vac range • 0.3 – 0.4 mA at 240 Vac on the 240 Vac range
Over-voltage Tolerance	150% sustained over-voltage without damage
Power Requirements	• 5 Vdc @ 6 mA with LEDs off • 5 Vdc @ 40 mA with LEDs on
Visual Indicators	Logic-powered LEDs. Can be disabled to conserve power
Field Terminations	12...22 AWG, 15 A contacts
Dimensions	74 mm wide x 124 mm high x 45 mm deep (2.90 in. x 4.90 in. x 1.80 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	• 5% RH to 95% RH, non-condensing • –40...70 °C (–40...158 °F) operation • –40...85 °C (–40...185 °F) storage
Safety	• Class I, Division 2, Groups A, B, C and D and CSA certified to UL508 standards • ATEX II 3G and IECEx: Ex nA IIC T4 per EN 60079-15, protection type n (Zone 2) (5414-24 only) • Maximum permitted voltage in Canada or North America is 240 Vac • Maximum permitted voltage outside of Canada or North America is 30 Vac/42.4PK/60 Vdc

5414 Compact Digital Input Module Model Code

Part Number	Model	Description
TBUX297378	5414-24	12/24 Vac/Vdc, ATEX and IECEx

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5415 Compact Digital Output Module Specifications

General	
Number of Digital Outputs	12
Type	• Form A Contacts (Normally open), Dry Contact or Solid State Relay variants • 4 contacts per common
Contact Rating	• 12 A maximum per common • Dry Contact Version: 3 A, 30 Vdc or 250 Vac (Resistive) • Solid State Relay Version: 60 Vdc max., 3 A max. at 50 °C (122 °F), 2 A max. at 70 °C (158 °F)
Switching Capacity (Dry Contact Version)	• 5 A, 30 Vdc (150 W Resistive) • 5 A X 250 Vac (1250 VA Resistive)
5 V Power Requirements	• 5 mA Quiescent • Dry Contact version: 280 mA relays on, LEDs on • 260 mA relays on, LEDs off • Solid State Relay version: Relays on, LEDs on - 144 mA • Relays on, LEDs off - 120 mA
10-30 Vdc Power Requirements	• Dry Contact version: 1.0 W maximum with 1.65 W peak for 15 ms durations • Solid State Relay version: 1.0 W maximum
Visual Indicators	Logic-powered LEDs. Can be disabled to conserve power
Field Terminations	12...22 AWG, 15 A contacts
Dimensions	74 mm wide x 124 mm high x 45 mm deep (2.90 in. x 4.90 in. x 1.80 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	• 5% RH to 95% RH, non-condensing • –40...70 ºC (–40...158 ºF) operation • –40...85 ºC (–40...185 ºF) storage
Safety	• Class I, Division 2, Groups A, B, C and D and CSA certified to UL508 standards • ATEX II 3G and IECEx: Ex nA IIC T4 per EN 60079-15, protection type n (Zone 2) (5415-A only) • Maximum permitted voltage in Canada or North America is 240 Vac • Maximum permitted voltage outside of Canada or North America is 30 Vac/42.4 PK/60 Vdc

5415 Compact Digital Output Module Model Code

Part Number	Model	Description
TBUX297382	5415	12-Point Compact Mechanical Relay Output Module
TBUX297384	5415-A	12-Point Compact Solid-State Relay Output Module, ATEX and IECEx

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5502 Differential Analog Input Module Specifications

General	
Input Points	8: voltage or current inputs, each input is switch selectable as voltage or current
Ranges	Voltage -10 Vdc...+10 Vdc, Current -20 mA...+20 mA
Resolution	Voltage 1.22 mVdc, Current 4.88 µA
Input Resistance	Voltage > 10 MΩ, Current 250 Ω
Converter Type	13-bit plus sign successive approximation
Accuracy	• +/- 0.1% of full scale at 25 °C (77 °F) • +/- 0.2% of full scale over temperature range
Isolation	• 550 Vac from any input to the chassis or the system power supplies. • 140 Vac/200 Vdc between inputs
Common Mode Rejection	• >96 dB at 50/60 Hz, >50 dB at 10 KHz. with 1 KΩ imbalance • >50 dB at 1 KHz. with 10 KΩ imbalance
Normal Mode Rejection	>45 dB at 50/60 Hz
Transient Protection	• Transient suppressors and fuses on each input • 2.5 kV surge withstand capability as per ANSI/IEEE, C37.90.1-1989
Over-Scale Input Capacity	12 Vdc maximum. Exceeding 12 Vdc will cause the fuse to blow
Input Fuses	1/8 A
Reading Update Time	170 ms with 60 Hz. rejection selected. 185 mS with 50 Hz rejection selected
Power Requirements	5 Vdc @ 100 mA
Terminations	2: 8-pole, removable terminal blocks, 12...22 AWG, 15 A contacts
Dimensions	144 mm wide x 118 mm high x 44 mm deep (5.65 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, -40...60 °C (-40...140 °F)
Safety	Class 1, Division 2 for use in hazardous locations

5502 Differential Analog Input Module Model Code

Part Number	Model	Description
TBUX297211	5502	Differential analog input module

Notes: Accessories sold separately. This product is not RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5504 Thermocouple Input Module Specifications

General	
Input Points	8 thermocouples or millivolt signals
Thermocouple Types and Ranges	• J: -200...760 °C (-328...1400 °F) • K: -270...1370 °C (-454...2498 °F) • E: -270...1000 °C (-454...1832 °F) • T: -270...400 °C (-454...752 °F) • mVdc ±80 mVdc
Resolution	0.004 mV, approximately 0.10 °C (0.18 °F)
Input Resistance	1 MΩ
Accuracy Over -40...60°C Operating Temperature Range	• J: ±0.20% of full scale • K: ±0.20% of full scale • E: ±0.15% of full scale • T: ±0.50% of full scale • mV ±0.15% of full scale
Cold Junction Compensation	• ±0.5 °C (0.9 °F) maximum error from 0°...60 °C (32...140 °F) • ±1 °C (1.8 °F) maximum error from -40...0 °C (-40...32 °F)
Converter Type	±20000 count, integrating
Common Mode Voltage Range	±10 Vdc can be applied to the inputs, relative to the -24 Vdc power supply input
Isolation	500 Vac from the logic power
Transient Protection	MOVs on each input
Response Time	0.5 seconds
Power Requirements	• > 5 Vdc @ 40 mA • > 20...28 Vdc @ 45 mA
Terminations	10-pole and 8-pole, two fixed terminal blocks, 12...22 AWG, 15 A contacts
Power Requirements	5 Vdc @ 100 mA
Terminations	2: 8-pole, removable terminal blocks, 12...22 AWG, 15 A contacts
Dimensions	144 mm wide x 118 mm high x 44 mm deep (5.65 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, -40...60 °C (-40...140 °F)
Safety	Class 1, Division 2 for use in hazardous locations

5504 Thermocouple Input Module Model Code

Part Number	Model	Description
TBUX297166	5504	Thermocouple input module

Notes: Accessories sold separately. This product is not RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5505 RTD Input Module Specifications

General	
Input Points	4, RTD
RTD Type	100 Ω platinum, 3 and 4-wire, auto-detection and compensation
Calibration	0.00385 Ω / °C standard based on ASTM E 1137/E 1137M-04, ITS-90
Ranges	• 5505: Can be configured to return data in Ω, °C, °F or °K -200...800 °C (-328...1472 °F) 0 to 500 Ω • 5503 Emulation: Dipswitch selectable 0...200 °C (32...392 °F) -100...100 °C (-148...212 °F) -200...0 °C (-328...32 °F) 0...800 °C (32...1472 °F) 0...400 °C (32...752 °F) 0 to 400 Ω
Data Format	• 5505: 32-bit floating point and 12 status bits • 5503 Emulation: 16-bit signed integer
Resolution	• 5505: > 17-bit effective • 5505 Emulation: 15-bit
RTD Status	• RTD is good (not open) • RTD in range • RTD 3 or 4-wire • RTD status not available in 5503 Emulation
Accuracy on RTD Ranges	Percent of full scale over operational temperature range including linearization errors: +0.10%/-0.05%
Accuracy on 0...500 Ω	Percent of full scale over operational temperature range: ±0.03%
Excitation Current	4 mA, 7.2% duty cycle in 4-wire mode, 14.4% in 3-wire mode, 250 ms scan interval
Line Resistance	100 Ω max., in each line
Converter Type	24-bit delta-sigma
Response Time	380 ms typical for 10% to 90% signal change at minimum filter setting
Transient Protection	2.5 kV surge-withstand capability as per ANSI/IEEE C37.90.1-1989
Isolation	Isolation from logic supply and chassis, voltage 500 Vrms
5 Vdc Power Requirements	6 mA
11 - 30 Vdc Power Requirements	• 12 Vdc operation: 4 mA plus 0.6 mA per 4-wire RTD plus 1.2 mA per 3-wire RTD • 24 Vdc operation: 2.2 mA plus 0.3 mA per 4-wire RTD plus 0.6 mA per 3-wire RTD
11...30 Vdc - Connector	Removable. Shared with RTD inputs 0-1
11...30 Vdc - Isolation	Isolation from logic supply and chassis
Terminations	8 and 10-pole, removable terminal block,12...22 AWG, 15 A contacts

Selection Guide

I/O Expansion Modules

5505 RTD Input Module Specifications cont'd

General	
Dimensions	74 mm wide x 124 mm high x 45 mm deep (2.90 in. x 4.90 in. x 1.80 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, -40...70 °C (-40...158 °F) operation, -40...85 °C (-40...185 °F) storage
Safety	• Non-Incendive Electrical Equipment for Use in Class I, Division2 • Groups A, B C and D Hazardous Locations • ATEX II 3G and IECEx: Ex nA IIC T4 per EN 60079-15, protection type n (Zone 2)

5505 RTD Input Module Model Code

Part Number	Model	Description
TBUX297318	5505	RTD input module

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5506 Analog Input Module Specifications

General	
Input Points	8
Ranges	• 0...20 mA • 4...20 mA • 0...5 Vdc • 1...5 Vdc
LED Indicators	8 red LEDs, indicating current input, voltage input and under or over-range signal applied
Input Configuration	Individual inputs configurable with 4 mA/1 Vdc (20%) offset and for voltage/current operation when configured as a 5506. All inputs dipswitch-selectable with 4 mA/1 Vdc (20%) offset and for voltage/current operation when configured to emulate a 5501 module.
Input Resistance	250 Ω - Current configuration ; 66 k Ω - Voltage configuration
Resolution	15-bits over the 0...5 V and 0...20 mA measurement range
Type	Single-ended
Accuracy	±0.1% of full scale at 25 °C (77 °F) ; ±0.2% over temperature range
Transient Protection	2.5 kV surge-withstand capability as per ANSI/IEEE C37.90.1-1989
Normal Mode Rejection At 60 Hz with 60 Hz Scanning	• 53 dB with 3 Hz filter • 50 dB with 6 Hz filter • 49 dB with 11 Hz filter • 45 dB with 30 Hz filter
Normal Mode Rejection At 50 Hz with 50 Hz Scanning	• 73 dB with 3 Hz filter • 56 dB with 6 Hz filter • 52 dB with 11 Hz filter • 49 dB with 30 Hz filter
Response Time for 10% to 90% Signal Change (60 Hz Scanning)	• 250 ms with 3 Hz filter • 130 ms with 6 Hz filter • 60 ms with 11 Hz filter • 30 ms with 30 Hz filter
Response Time for 10% to 90% Signal Change (50Hz Scanning)	• 300 ms with 3 Hz filter • 140 ms with 6 Hz filter • 80 ms with 11 Hz filter • 40 ms with 30 Hz filter
Over-Scale Input Capacity (without damage)	Continuous: 0.10 A/14 Vdc on the 20 mA inputs ; 0.05 A/14 Vdc on the 5 Vdc inputs
Isolation	500 Vac isolation from logic supply and chassis
5 Vdc Power Requirements	• 22 mA, LEDs off • 45 mA, LEDs on
11...30 Vdc Power Requirements	11 mA
11...30 Vdc - Connector	Removable, 4 positions
11...30 Vdc - Isolation	Isolation from logic supply and chassis

Selection Guide

I/O Expansion Modules

5506 Analog Input Module Specifications

General	
Terminations	10-pole, removable terminal block,12...22 AWG, 15 A contacts
Dimensions	74 mm wide x 124 mm high x 45 mm deep (2.90 in. x 4.90 in. x 1.80 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing, -40...70 °C (-40...158 °F) operation, -40...85 °C (-40...185 °F) storage
Safety	• Non-Incendive Electrical Equipment for Use in Class I, Division2 • Groups A, B C and D Hazardous Locations • ATEX II 3G and IECEx: Ex nA IIC T4 per EN 60079-15, protection type n (Zone 2)

5506 Analog Input Module Model Code

Part Number	Model	Description
TBUX297319	5506	Analog input module

Notes: Accessories sold separately. This product is RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

I/O Expansion Modules

5606 | 5607 Analog/Digital I/O Modules Specifications

Digital and Analog Inputs/Outputs

I/O Module	5606	5607
Analog Inputs	8	8
Analog Outputs	2 (option)	2 (option)
Digital Inputs	32	16
Digital Outputs	16	10

I/O

Analog Inputs	Software configurable to 0...20 mA, 4...20 mA, 0...5 Vdc or 0...10 Vdc • Resolution: 15-bit ADC (15-bit over the measurement range in 10 Vdc, 14-bit in 20 mA) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0.2% over temperature range • Input Resistance: 250 Ω or 20 kΩ in 20 mA or 10 Vdc configurations • Isolation: 500 Vac from logic and chassis • Normal rejection mode: 27 dB at 60 Hz
Analog Outputs	0...20 mA, 4...20 mA, voltage output may be accomplished with external precision resistor • Resolution: 12-bit over 0...20 mA range • Accuracy: ±0.15% at 25 °C (77 °F), ±0.35% of full scale over temperature range • Response Time: less than 10 µs for 10% to 90% signal change • Power Supply: 12…30 Vdc, external • Power (Current) Requirements: 10 mA plus up to 20 mA per output • Isolation: isolated from RTU logic and chassis • Load Range: 12 Vdc: 0…375 Ω, 24 Vdc: 0…925 Ω, • Logic End-Of- Scan to Signal Update Latency: typically 18... 27 ms
Digital Inputs	12…24 Vdc • Turn on voltage: 9 Vdc (minimum), Turn off voltage: 4 Vdc (maximum) • Over-voltage tolerance: 150% sustained over-voltage without foreseeable damage • DC input current: 0.67 mA at 24 Vdc • Isolation : in group of 8, 1500 Vac from logic supply and chassis
Digital Outputs	Relays (Form A) • 4 contacts share one common • Isolation : isolated in groups of 4. Isolated from RTU logic, RTU chassis and other groups to 1500 Vac • Maximum Switching Voltage: 30 Vdc • Maximum Switching Load: 150 W or 1250 VA (5 A)

General

Power Supply	• Analog Inputs & Outputs: 12 mA at 12…30 Vdc, plus analog output requirements • Digital Inputs & Outputs: 650 mA at 5 Vdc, fully loaded
I/O Terminations	• 5606: 5, 9, 10-pole connectors, 0.0810...3.31mm2 (28...12 AWG), solid or stranded. • 5607: 5, 9, 12-pole connectors, 0.0810...3.31mm2 (28...12 AWG), solid or stranded

Selection Guide

I/O Expansion Modules

5606 | 5607 Analog/Digital I/O Modules Specifications cont'd

General cont'd		
Dimensions	• 5606: 211.8 mm (8.34 in.) wide, 181.0 mm (7.13 in.) high, 46.5 mm (1.83 in.) deep • 5607: 144.0 mm (5.65 in.) wide, 181.0 mm (7.13 in.) high, 46.5 mm (1.83 in.) deep	
Enclosure	Corrosion-resistant zinc-plated steel with black enamel paint	
Environment	• Conformal-coated • -40...70 °C (-40...158 °F) operating, -40...85 °C (-40...185 °F) storage • 5% RH to 95% RH, non-condensing	
Certifications (three versions available: S for standard, X for ATEX/IECEx and U for Class I Div 2)		
S Version	EMC and radio frequency	• FCC 47 CFR Part 15, Subpart B • ICES-003 Issue 5 August 2012 • CE and RCM markings
	General Safety	UL 508
X Version	5606 and 5607 - Adds: IECEx/ATEX Class I, Zone 2	
U Version	5606 and 5607 - Adds: cCSAus Non incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D	

5606 | 5607 Analog/Digital I/O Modules Model Code

Model	Part Number
5606	• No AO: TBUX297328S, TBUX297328X, TBUX297328U • With 2AO: TBUX297334S, TBUX297334X, TBUX297334U
5607	• No AO: TBUX297478S, TBUX297478X, TBUX297478U • With 2AO: TBUX297482S, TBUX297482X, TBUX297482U

Notes: Accessories sold separately. These products are RoHS-compliant.
Some I/O Expansion modules are specific to SCADAPack 300 RTUs, others are specific to SCADAPack E RTUs.

Selection Guide

Communication Modules

6601 Combination IO Module for SCADAPack x70 RTU Specifications

IO	
Digital Inputs	16: Typical Operating Voltage: 12...24 Vdc Turn-on Voltage Minimum: 9 Vdc Turn-off Voltage Maximum: 4 Vdc Over-voltage Tolerance: 36 Vdc sustained over-voltage without foreseeable damage Input Current • 0.9…1.2 mA at 12 Vdc • 2.1…2.4 mA at 24 Vdc Timestamping: 1 ms Sequence of Event (SOE) Isolation: • Isolation is in 2 groups of 8 • Isolation from device logic and chassis • 1000 Vac or 1500 Vdc
Counter Inputs	8 Electrical Characteristics: Shared with digital input channels Reporting: • 16-bit and 32-bit counters • Deviation • Timestamped events • Polled, unsolicited reporting Frequency: Up to 8 channels: • DI 1 to 4: 0...1.5 kHz • DI 5 to 8: 0...150 Hz
Digital Outputs	8 Type: • 2 Form C single-pole double-throw (SPDT) relays available to the application • Separate Normally Open/Normally Closed/Common • 6 Form A relays available to the application • Normally Open, one Common Isolation: 500 Vac minimum to device logic Maximum Switching Voltage: 30 Vdc or 25 Vac Maximum Switching Load: • 60 W or 50 VA per relay • 2 A per relay • 2 A per common on digital outputs 1-2 • 12 A per common on digital outputs 3-8 Status and reporting: • Individual relay pole feedback to software • Output state poll Temperature de-rating: Mounted horizontally on a vertical surface: 2 A maximum per relay at 60 °C (140 °F), de-rate by 0.1 A per 1 °C to 1 A maximum per relay at a maximum ambient temperature of 70 °C (158 °F) Mounted in any other position: 2 A maximum per relay at 60 °C (140 °F), de-rate by 0.1 A per 1 °C to 1.5 A maximum per relay at a maximum ambient temperature of 65 °C (149 °F) Controls: • Direct Operate • Select Before Operate • Trip/Close • Latch • Pulse

Selection Guide

Communication Modules

6601 Combination IO Module for SCADAPack x70 RTU Specifications

IO	
Analog Inputs	6 Type: Uni-polar, differential, voltage or current Resolution (filtered): • 24-bit conversion yields an effective 19 bits of resolution during filtered conversions • 10 µV on the 5 Vdc range • 40 nA resolution on the 20 mA range Resolution (fast): • 24-bit conversion yields an effective 13 bits of resolution during unfiltered conversions. • 0.6 mV resolution on the 5 Vdc range • 2.4 µA resolution on the 20 mA range Accuracy: • ±0.1% of full scale at 25 ºC (77 ºF) • ±0.2% over-temperature range Isolation: 250 Vac isolation between channels and from device logic and chassis Input resistance: • 250 Ω in current configurations • 800 kΩ in voltage configurations Ranges: • Input Type: 4...20 mA, 0...20 mA, 1...5 Vdc, or 0...5 Vdc • Under-range: 4...20 mA measures to 0 mA • Individual inputs can be configured for current or voltage operation using DIP switches. • Calibration in voltage mode 1...5 Vdc is available as an option. Sampling Rate: • Filtered: 500 ms per 6 channels • Fast: 30 ms per 6 channels Common Mode Rejection: 80 dB Normal Mode Rejection: • Filtered: 86 dB (50/60 Hz) • Fast: Not applicable Reporting: • Deviation • 8 alert limits • Under- and over-range events • Quality flags • Integer/floating point • Timestamped events • Polled, unsolicited reporting on deviation and per alert limit Timestamping: 30 ms Sequence of Event (SOE) I/O Cable Length: 30 m (98.4 ft) Maximum

Selection Guide

Communication Modules

6601 Combination IO Module for SCADAPack x70 RTU Specifications

IO	
Analog Outputs	2: with optional analog outputs Type: Uni-polar Resolution: 12-bit over 0...20 mA range Accuracy: • ±0.15% at 25 °C (77 ºF) • ±0.35% of full scale over-temperature range Response Time: Less than 10 µs for 10% to 90% signal change Power Supply (External): 12…30 Vdc Power Supply Cable Length: 30 m (98.4 ft) Maximum Power (Current) Requirements: 10 mA plus up to 20 mA per output Isolation: • Transformer • 500 Vdc maximum to device logic and chassis Range: • 0...20 mA • 4...20 mA • Voltage output may be accomplished with external precision resistor Status and Reporting: • Power missing • Open loop detected • Values out of range • ADC reference check Controls: • Direct Operate • Select Before Operate Load range: • 12 Vdc: 0…475 Ω • 24 Vdc: 0…1075 Ω • 30 Vdc: 250…1375 Ω
General	
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
Elevation	3,000 m (9,842 ft)
Terminations	3.3...0.05 mm2 (12...30 AWG), solid or stranded
Dimensions	150.5 mm wide X 182.3 mm high X 44.7 mm deep (5.9 in. wide X 7.2 in. X 1.8 in. deep)
Packaging	Corrosion-resistant, zinc-plated steel with black enamel paint
Mechanical 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
I/O Expansion Limits	Typically 4. Refer to the appropriate SCADAPack Hardware Manual for further details.
Power requirements at 30 Vdc from the SCADAPack RTU	1.1 W

Selection Guide

Communication Modules

6601 Combination IO Module for SCADAPack x70 RTU Specifications

Certifications	
Industrial standards	Requirements specific to the RTU functional characteristics, immunity, robustness, and safety: • IEC/EN 61131-2 • CSA 22.2 No. 61010-1-12 and 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 www.se.com • For the latest information regarding product compliance with RoHS, WEEE directives and REACH regulation, visit the Schneider Electric Check a Product portal at www.reach.schneider-electric.com
Installation in classified Ex area	• Hazardous locations Class I, Division 2, groups A, B, C, and D and Class I, Zone 2 according to CSA C22.2 No. 213, CSA C22.2 60079-0, CSA C22.2 60079-15, ANSI/ISA 60079-0, ANSI/ISA 60079-15, ANSI/ISA 12.12.01 • ATEX (European directive 2014/34/EU) in defined atmosphere Zone 2 according to EN 60079-0 and EN 60079-15 • IECEx in defined atmosphere Zone 2 according to IEC 60079-0 and IEC 60079-15
Specific Countries	• For Australia and New Zealand: ACMA requirements for RCM marking • For United States: FCC Part 15 Subpart B Class A

6601 Combination IO Module for SCADAPack x70 RTU Model Code

Part Number	Complete the desired part number with an S, X, or U suffix depending on certification required.
S	EMC and radio frequency: • FCC 47 CFR Part 15, Subpart B • ICES-003 • CE and RCM markings • General safety UL/CSA 61010-2-201
X	Adds: IECEx/ATEX: Ex nA nC IIC T4 Gc -40 °C ≤ Ta ≤ +70 °C (Ex) II 3 G
U	Adds: cCSAus Non-Incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D, T4, -40 °C ≤ Ta ≤ +70 °C , Class I Zone 2, T4
TBUX297583	Model 6601-20mA, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/4…20 mA)
TBUX297584	Model 6601-5V, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/1…5 Vdc)
TBUX297585	Model 6601-20mA, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/4…20 mA), 2 A/O (external DC supply)
TBUX297586	Model 6601-5V, 16 D/I 12...24 Vdc, 8 Dry Contact Relay O/P, 6 config. A/I (0/1…5 Vdc), 2 A/O (external DC supply)

Selection Guide

Communication Modules

6602 HART I/O Expansion Module for SCADAPack x70 RTU Specifications

IO	
HART	• HART scan rate <10 seconds typical1 • HART pass-through provided by SCADAPack x70 RTU supports HART protocol • revisions 5, 6, and 7 • Each device communicates on a separate 4...20 mA analog channel
Analog Inputs	8 analog inputs: • Software-configurable as 4...20 mA (HART enabled) or 0...20 mA (HART disabled) • Uni-polar, differential • Resolution: 24-bit ADC (effective: 14-bits over the measurement range) • Accuracy: ±0.1% of full scale at 25 °C (77 °F), ±0.2% over operating temperature range • Scan rate: typical 270 mSec for 8 channels with no filtering (Fast setting), 800 mSec with 50/60 Hz filtering • Isolation: 50 Vac/70 Vdc from channel to channel, and 250 Vac/350 Vdc to logic and • chassis • Input Resistance: 280 Ω • Under-range: 4...20 mA measures to 0 mA • Common Mode Rejection: -80 dB (@60 Hz. when configured for 50/60Hz filtering)
Analog Outputs	4 analog outputs: • Software-configurable as 4...20 mA (HART enabled) or 0...20 mA (HART disabled) • Uni-polar • Resolution: 16-bit DAC • Accuracy: ±0.15% of full scale at 25 ˚C (77 ˚F), ±0.35% over operating temperature range • Power Supply: 12…30 Vdc, external, shared by each channel • Power Requirement: 20 mA (internal supply) plus up to 20 mA per output (from external supply) • Isolation: 250 Vac/350 Vdc to RTU logic and chassis • Load Range: 12 Vdc: 0…450 Ω, 24 Vdc: 0…1050 Ω, 30 Vdc: 250…1350 Ω • Status & Reporting: Open Loop status, output value poll
General	
Power Supply	• Power consumption 1.3 W from internal 5 Vdc supply (source: SCADAPack x70 RTU) • One external 12...30 Vdc power supply for analog outputs, up to 20 mA per loop.
I/O Terminations	Plug-in terminal blocks, 0.0810...3.31 mm2 (28...12 AWG), solid or stranded
Dimensions	102.0 mm (4.02 in.) wide, 182.4 mm (7.18 in.) high, 47.1 mm (1.85 in.) deep
Enclosure	Corrosion resistant zinc-plated steel with black enamel paint
Environment	• Conformal coated • -40...70 °C (-40...158 °F) operating, -40...85 °C (-40...185 °F) storage • Cold start at -40 °C (-40 °F) • 5% RH to 95% RH, non-condensing
Certifications	• EMC and radio frequency FCC 47 CFR Part 15, Subpart B • ICES-003 • CE and RCM markings • General safety UL/CSA 61010 • Hazardous locations cCSAus Non-Incendive Electrical Equipment for use in Class I, Division 2, • Groups A, B, C and D • IECEx/ATEX: Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +70 °C

Selection Guide

Communication Modules

6602 HART I/O Expansion Module for SCADAPack x70 RTU Specifications cont'd

General cont'd	
Shock & Vibration	IEC 60068-2-27 (tested up to 15 g), IEC 60068-2-6
Certifications (three versions available: S for standard, X for IECEx/ATEX and U for Class I Div 2)	
S	EMC and radio frequency FCC 47 CFR Part 15, Subpart B ICES-003 CE and RCM markings General safety UL/CSA 61010
X	Adds: IECEx/ATEX: Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +70 °C
U	Adds: cCSAus Non-Incendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D

6602 HART I/O Expansion Module for SCADAPack x70 RTU Model Code

Part Number	Model	Description
TBUX297590S, TBUX297590X, TBUX297590U	6602	8AI and 4AO
TBUX297591S, TBUX297591X, TBUX297591U	6602	8AI

Notes: Accessories sold separately. This product is RoHS-compliant.

Footnote: [1] HART scan rate is dependent on the number of connected HART devices, communication loading due to pass-through messaging, and HART device response times.

Selection Guide

Communication Modules

6607 Combination IO Module for SCADAPack x70 RTU Specifications

Green Premium™ Product

IO	
Digital Inputs	16: Voltage: 12 Vdc or 24 Vdc (Typical) Over-voltage tolerance: • 36 Vdc • 150% sustained over-voltage without foreseeable damage Input current: • 1.2 mA typical at 12 Vdc • 2.4 mA typical at 24 Vdc Input logic-HI level: OFF to ON transition threshold is typically 6.5 Vdc Timestamping: 10 ms Sequence of Event (SOE) Status: Chatter filter detection when digital state changes faster than 5 Hz Isolation: • Isolation is in 2 groups of 8 • Isolation from logic supply and chassis: 250 Vac/350 Vdc
Counter Inputs	8: Electrical characteristics: Shared with digital input channels Reporting: • 32-bit counters • Deviation • Timestamped events • Unsolicited reporting DI1, DI2, DI3, and DI4-supported counting: • Range: 0 to 1.5 kHz • Rising edge counting • Falling edge counting (using digital input state inversion) DI5, DI6, DI7, and DI8-supported counting: • Range: 0 to 500 Hz • Rising edge counting • Falling edge counting (using digital input state inversion)
Digital Outputs	10: Type: • Form A Contacts (normally open) • 5 contacts share one common Inductive loads: • To suppress the noise in AC and DC circuits and help extend the life of the relay contacts, place a metal oxide varistor (for AC circuits) or a diode (for DC circuits) across the coil. See Digital Output Wiring Example for further information Isolation: • Isolation is in 2 groups of 5 • 250 VAC / 350 VDC maximum to SCADAPack logic and chassis Dry Contact Relay Version Contact rating: • 2 A, 30 VDC • 10 A maximum per common

Selection Guide

Communication Modules

6607 Combination IO Module for SCADAPack x70 RTU Specifications

Green Premium™ Product

IO	
Analog Inputs	8: Ranges: Software-configurable • 0…20 mA • 4…20 mA • 0…5 Vdc • 1…5 Vdc Resolution (100 ms sampling): • 24-bit conversion • 0.25 mV resolution on 5 Vdc range • 1 µA resolution on 20 mA range Accuracy: • ±0.1% of full scale at 25 °C (77 °F) • ±0.2% over temperature range Input resistance: • 250 ohms in current configurations • 1 Mohms in voltage configurations Isolation: 250 Vac / 350 Vdc maximum to SCADAPack logic and chassis Cable length Maximum: 30 m (98.4 ft)
Analog Outputs	• 2: Ranges: • 0...20 mA sourcing • 4...20 mA sourcing Reporting: Open Loop Detection (for 0...20 mA configuration, open loop detection operates above 0.1% of full span. i.e. above 0.02 mA) Resolution: 12-bit (5.9 uA) Load range • 12 Vdc: 0…400 ohms • 24 Vdc: 0…1000 ohms • 30 Vdc: 250…1300 ohms Accuracy • ±0.15% of full scale at 25 °C (77 °F) • ±0.35% of full scale over temperature range Noise and ripple: 0.04% maximum Logic end-of-scan to signal update latency: With up to 10, 5000 series I/O modules Typical: 18...27 ms Response time (DAC to signal): Less than 100 µs for 10% to 90% signal change Isolation: Optional isolation from logic supply by using external power supply Cable Length: Maximum: 30 m (98.4 ft) Load range: • 12 Vdc: 0…400 ohms • 24 Vdc: 0…1000 ohms • 30 Vdc: 250…1300 ohms

Selection Guide

Communication Modules

6607 Combination IO Module for SCADAPack x70 RTU Specifications

General	
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
Elevation	3,000 m (9,842 ft)
Terminations	3.3...0.05 mm2 (12...30 AWG), solid or stranded
Dimensions	• 142 mm (5.6 in) wide • 166 mm (6.5 in) high • 46 mm (1.8 in) deep
Packaging	Corrosion-resistant, zinc-plated steel with black enamel paint
Mechanical 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 from the SCADAPack	1.2 W
Certifications	
Industrial standards	Requirements specific to the SCADAPack functional characteristics, immunity, robustness, and safety: • IEC/EN 61131-2 • CSA 22.2 No. 61010-1-12 and 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 compliance with RoHS, WEEE directives and REACH regulation, visit the Schneider Electric Check a Product portal at https://www.reach.schneider-electric.com
Installation in classified Ex area	Hazardous locations Class I, Division 2, groups A, B, C, and D, T4 and Class I, Zone 2, IIC according to CSA C22.2 No. 213-17 and ANSI/ISA 12.12.01
Specific countries	• For Australia and New Zealand: ACMA requirements for RCM marking • For United States: FCC Part 15 Subpart B Class A

6607 Combination IO Module for SCADAPack x70 RTU Model Code

Part Number	Model	Description
TBUX297592S	6607	16, DI, 8 CI, 10 DO, 8 AI, 2 AO

Selection Guide

Communication Modules

5904 HART Interface Module Specifications

General	
Modulation	• Bell 202 Frequency Shift Key (FSK) • Mark = 1200 Hz • Space = 2200 Hz
Data Rate	1200 baud
Transmit Level	500 mVp-p into 250 Ω
Receive Sensitivity	• 120 mVp-p guaranteed on • 80 mVp-p guaranteed off
Output Impedance	• 300 Ω • Transformer-isolated
Input Impedance	• 4000 Ω • Transformer-isolated
Load Resistor	250 Ω, 1 Watt maximum
Visual Indicators	• TX: Transmitted data LED • RX: Received data LED
Power Requirements	5 Vdc @ 20 mA
Terminations	4-pole, removable terminal block, 12...22 AWG, 15 A contacts
Dimensions	108 mm W. x 118 mm H. x 44 mm D. (4.25 in. x 4.625 in. x 1.75 in.)
Mounting	7.5 x 35 DIN rail
Packaging	Corrosion-resistant zinc-plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing; -40...70 °C (-40...158 °F)
Safety	cCSAus and cULus Class I, Division 2 Hazardous Area Rating, UL508 listed

5904 HART Interface Module Model Code

Part Number	Model	Description
TBUX297205	5904	HART interface module

Notes: Accessories sold separately. This product is not RoHS-compliant.

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