

SCADAPack 350E | 357E

Smart Remote Terminal Units



The SCADAPack™ 300E Smart RTU is a platform built on a 32-bit processor and fitted with a 12...30 Vdc supply, various communication links and a wide range of analog and digital I/O that adheres to open standards and can operate in the harsh demands of a remote environment.

The SCADAPack 300E controller may be configured and programmed locally or remotely and is optionally configurable directly from StruxureWare™ SCADA Expert ClearSCADA™ host software. It can play multiple roles simultaneously: end point, automation point, data concentrator, protocol converter, peer-to-peer device and a telemetry router, and use Secure Authentication.

The SCADAPack 350E/357E Smart RTU provides the following features:

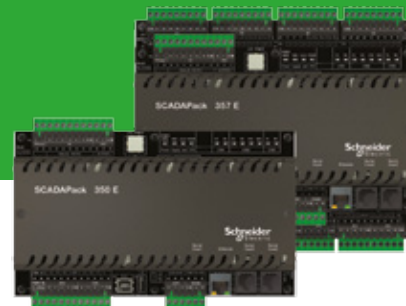
- Open-standard telemetry protocols IEC 60870-5-101/-104 and DNP3 level 4 with Security Suite (Secure Authentication and/or Data Encryption)
- Open-standard industrial protocols Modbus™ RTU/TCP and DF1 master
- Open-standard IEC 61131-3 programming environment

- Data concentrator for DNP3, Modbus and DF1 devices
- Communication with up to 13 active SCADA masters, up to 10 remote/local slave devices and up to 100 remote DNP3 devices in peer-to-peer mode
- Remote management suite (amend configuration, modify programs and update firmware remotely, using open standard DNP3)
- Up to 76 integrated digital/analog inputs/outputs, and more with I/O expansion modules
- 1 Ethernet, 3 Serial, 1 USB configuration port
- Tool-less DIN rail mounting system
- IP2x terminal blocks
- Operation from -40 to +70°C (-40 to +158°F)
- Cost-effective, compact form factor

When fed from a solar supply, the SCADAPack 350E controller can power its embedded analog inputs/outputs using its integrated auxiliary supply Vloop and 12 to 24 Vdc booster, thus having the ability to switch off this supply to reduce power consumption and help increase battery back-up autonomy.

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Specifications – General characteristics

Controller

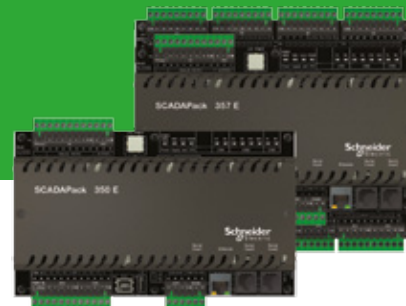
Processor	<ul style="list-style-type: none"> 32-bit ARM7 microcontroller, 32 MHz clock, integrated watchdog timer. Two microcontroller IO co-processors, 20 MHz clock
Memory	<ul style="list-style-type: none"> 16 MB FLASH ROM, 4MB CMOS RAM, 4kB EEPROM CMOS SRAM with lithium battery retains contents for 2 years with no power
Event Logging Capacity (events)	20,000 events
Database Capacity	Up to 1,000 points
Data Concentrator Capacity (points)	Up to 500 in DNP3
Data Concentrator Capacity (devices)	Up to 10 in DNP3 and up to 10 in Modbus or DF1
File System Typical Storage	Internal: 6MB

Communications

Serial Port : COM1 Serial Port : COM2	<ul style="list-style-type: none"> 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
Embedded Wireless	The controller may embed an unlicensed radio module (different options in 900 Mhz or 2.4 Ghz) that uses one of the serial ports
Serial Protocols	DNP3 level 4 slave/master and peer-to-peer, IEC 60870-5-101 slave, Modbus slave/master, DF1 master
Ethernet port	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100Base-T), transformer-isolated
IP Protocol	<ul style="list-style-type: none"> DNP3 level 4 in TCP Master/Slave, UDP Master/Slave and peer-to-peer, IEC 60870-5-104 Slave, Modbus/TCP Server, Modbus/ TCP Client, Modbus RTU in TCP Client NTP Client/Server, Telnet Server, FTP Server, BOOTP Server
Master – Slave Capability	<ul style="list-style-type: none"> Can simultaneously report to up to multiple independent active masters: 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 slaves, and up to 10 local slaves 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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Specifications – General characteristics

General

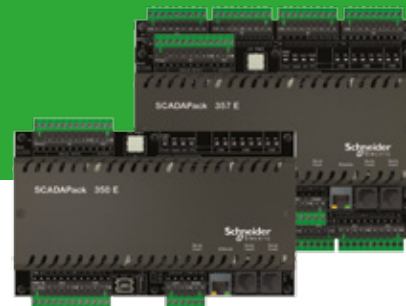
Logic Control	IEC 61131-3 SCADAPack Workbench programming suite (LD, ST, FBD & SFC)
I/O Terminations	SCADAPack 350E: 6, 12-pole connector, 0.0810...3.31mm ² (28...12 AWG), solid or stranded SCADAPack 357E: 5, 6, 7, 9, 10, 12-pole connectors, 0.0810...3.31mm ² (28...12 AWG), solid or stranded
Dimensions	SCADAPack 350E: 211.8mm (8"34) wide, 140.4mm (5.53") high, 46.5mm (1.83") deep SCADAPack 357E: 211.8mm (8"34) wide, 181.0mm (7.13") high, 66.0mm (2.60") deep
Enclosure	Corrosion resistant zinc-plated steel with black enamel paint
Environment	<ul style="list-style-type: none"> Conformally coated -40°C (-40°F) to 70°C (158°F) operating, -40°C (-40°F) to 85°C (185°F) storage 5% RH to 95% RH, non-condensing
Shock & Vibration	IEC 60068-2-27 (tested up to 15g), IEC 60068-2-6
Warranty	3 years on parts and labor

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)				
	<ul style="list-style-type: none"> SCADAPack 350E typical power consumption (at 20°C/ 68°F) 				
Power Requirements		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
	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Maximum 140mA at 12 V (booster turned off) or 24 Vdc (booster turned on); can power up to 7 analog input/output loops 				

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Specifications – Digital and Analog Inputs/Outputs

Controller board

Analog Inputs	<ul style="list-style-type: none"> 5, user-selectable 0...10V or 0...20mA 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 10V, 14-bit in 20mA) Accuracy: $\pm 0.1\%$ of full scale at 25°C (77°F), $\pm 0.2\%$ over temperature range Input Resistance: 250 Ω or 20 kΩ in 20mA or 10V configurations (60 kΩ for 32.768V) Normal rejection mode: 27 dB at 60 Hz Sampling rate: 170 ms
Analog Outputs	<ul style="list-style-type: none"> 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: $\pm 0.15\%$ at 25°C (77°F), $\pm 0.35\%$ 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...925Ω, Logic End-Of- Scan to Signal Update Latency: typically 18... 27ms Status & Reporting: output value Controls: Direct Operate, Select Before Operate
Digital Inputs/Outputs	<ul style="list-style-type: none"> 8, user-selectable as inputs or outputs (open drain) As Digital Inputs <ul style="list-style-type: none"> Dry contact Time stamping: 170ms As Digital Outputs <ul style="list-style-type: none"> Sinking MOSFET output, rated 30V, 0.5A, ground return connected to Chassis Ground
Counter Inputs	<ul style="list-style-type: none"> 1, 0...10Hz (dry contact) 2, 0...10kHz (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°F...+167°F)

I/O board (357E only)

Analog Inputs	<ul style="list-style-type: none"> 8, software-configurable to 0...20, 4...20mA, 0...5 or 0...10V Same features as for the 5 analog inputs located on the controller board (see above) except isolation: <ul style="list-style-type: none"> Isolation: 500 Vac from logic and chassis
Analog Outputs	<ul style="list-style-type: none"> 2 (optional), 0...20/4...20mA, voltage output may be accomplished with external precision resistor Same features as for the analog outputs located on the controller board
Digital Inputs	<ul style="list-style-type: none"> 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 : 170ms Isolation : in group of 8, 1500 Vac from logic supply and chassis
Digital Outputs	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Supported modules : <ul style="list-style-type: none"> 5606, 5607, 5608 and 5610, and 5304, 5404, 5411, 5414, 5415, 5505 and 5506 Maximum number of modules per unit: <ul style="list-style-type: none"> SCADAPack 350E: 8 (*) SCADAPack 357E: 7 (*) (*): to reach this limit, additional power supply modules are required
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Model Code

SCADAPack 350E/357E

Model	Select : Controller
TBUP350	SCADAPack350E, Controller 32 bits, 5 Analog Inputs, 8 Digital I/O, 3 High Speed Counter Inputs
TBUP357	SCADAPack357E, Controller 32 bits, comes with the above plus additional I/Os

Code	Select : 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 mstr/slave/peer-to-peer, IEC 60870-5-101/104 Slave, Modbus RTU/TCP mstr/slave, TCP/IP, DF1 mstr

Code	Select: License Option
5	DNP3 Data Concentrator License (limit of 500 points from 10 IEDs), supports multiple DNP3 Masters (up to 3)
7	Adds WITS* protocol (available for SCADA Security Code C and Certification Code S only)

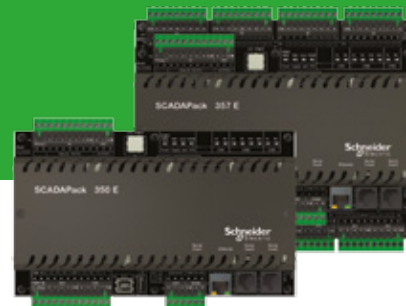
Code	Select : Analog Inputs
A	P350 : 5 selectable as 0...10V or 0...20mA *P357 : adds 8 selectable as 0...20mA, 4...20mA, 0...5V or 0...10V

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 (12-24V), 16 digital outputs (Dry Contact relay for Class I Div 2, Solid State relay for IECEx/ATEX)

* WITS protocol (Water Industry Telemetry Standard)

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Model Code

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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 : Integrated Communications Interfaces
0	None
FreeWave™ & MDS™ Radios (requires one RS232 port)	
1	900Mhz FreeWave Spread Spectrum Radio
A	900MHz MDS Spread Spectrum Radio
Trio™ Radios – 900MHz (requires one RS232 port)	
B	900MHz Trio Spread Spectrum Radio with encryption, 902-928MHz (FCC / IC)
C	900MHz Trio Spread Spectrum Radio with encryption, 915-928MHz (AUS)
D	900MHz Trio Spread Spectrum Radio, 915-928MHz (BRAZIL)
E	900MHz Trio Spread Spectrum Radio, 921-928MHz (NZ)
Trio Radios – 2.4GHz (requires one RS232 port)	
J	2.4GHz Trio Spread Spectrum Radio, ETSI/100mW, ATEX (EUROPE)
K	2.4GHz Trio Spread Spectrum Radio with Encryption, 500mW (CANADA, USA & AUSTRALIA)
L	2.4GHz Trio Spread Spectrum Radio, 500mW (OUTSIDE OF EUROPE, CANADA, USA & AUSTRALIA)

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

Disclaimer: Not all product features are available in every mode of operation. Schneider Electric reserves the right to change product specifications. For more information visit www.schneider-electric.com.

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