SCADAPack 530E | 535E
remote Programmable Automation Controller

Schneider Electric
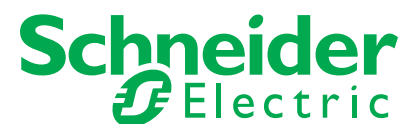
With the SCADAPack 500E range, Schneider Electric introduces the first ever remote Programmable Automation Controller (rPAC). This data sheet presents the first two models of that new range, the SCADAPack 530E and the SCADAPack 535E.

The ARC Advisory Group has defined the rPAC as a whole new way to look at remote site automation. An rPAC combines the power of a PAC with the versatility of an RTU.

The SCADAPack 500E rPAC is a platform that dramatically increases performance (execution speed, connectivity, number of remote/local I/O), adheres to open standards, and can operate in the harsh demands of a remote environment.

SCADAPack 500E provides:
- Open standard telemetry protocols such as DNP3 level 4 with Security Suite (Secure Authentication and/or Data Encryption) and IEC 60870-5-101/-104
- Open standard industrial protocols such as Modbus RTU, Modbus TCP and DF1
- Open standard IEC 61131-3 programming environment
- Data concentrator for any DNP3, Modbus or DF1 devices
- Up to 29 active SCADA masters, up to 100 remote/local slave devices and up to 100 remote DNP3 devices in peer-to-peer mode
- Remote management suite (ability to amend configuration, modify programs and update firmware remotely, using open standard DNP3)
- Up to 515 internal digital/analog inputs/outputs
- 1ms resolution time-stamped digital inputs, 30ms sampled analog inputs with 16-bit ADC
- 3 Ethernet and 4 Serial ports, 1 embedded 3G modem, 1 USB device port for configuration
- 1 USB host port for external storage (memory stick up to 32GB)
- Tool-free DIN rail mounting system
- Withstands 15g acceleration
- IP2x terminal blocks
- Operation from –40 to +70°C (–40 to +158°F)
- Compact form factor

Product Data Sheet SCADAPack 530E | 535E
Specifications

>	General characteristics

Controller

Processor	SPEAr 1380 32-bit dual-core Cortex A9 microcontroller, up to 600MHz
Memory	• 128MB NAND FLASH, 128MB 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 ±15kV (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 ±15kV (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 slave/master and peer-to-peer, IEC 60870-5-101 slave, Modbus slave/master, DF1 master
Ethernet Ports: Eth1, Eth2, Eth3	8-pin modular RJ45 jack, 10/100 Mbps UTP (10/100Base-T), transformer isolated
IP Protocols	• 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	• Can simultaneously report to up to 29 independent masters (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 slaves, and up to 100 local slaves 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)

General

Logic control	IEC 61131-3 SCADAPack Workbench programming suite (LD, ST, FBD & SFC)
I/O terminations	SCADAPack 530E: 11-pole connector, 0.0810...3.31mm^2 (28...12 AWG), solid or stranded SCADAPack 535E: 5, 6, 7, 9, 11-pole connectors, 0.0810...3.31mm^2 (28...12 AWG), solid or stranded
Dimensions	SCADAPack 530E: 150.5mm (5.93") wide, 134.8mm (5.31") high, 74.9mm (2.95") deep SCADAPack 535E: 150.5mm (5.93") wide, 182.3mm (7.18") high, 86.5mm (3.41") deep
Packaging	Corrosion resistant zinc-plated steel with black enamel paint
Environment	• -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

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Specifications

>	General characteristics

Power Supply

Rated Voltage	12...30 Vdc, 5W 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: 8.7W
Power Requirements	SP530E (Controller) 3.7 W SP535E (Controller with integrated IO) 4.8 W 6601 (Expansion IO) 1.1 W USB (5V at 100mA) 0.6 W Serial port (5V at 250mA) 1.5 W For analog output power requirements see the Analog Output specifications.

Power Consumption (W)

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

Certifications

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
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

Product Data Sheet SCADAPack 530E | 535E
Specifications

>	Digital and Analog Inputs/Outputs
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 30V, 0.5A, ground return connected to Chassis Ground
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 (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: -80dB (50/60Hz) • 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…1075Ω, 30 Vdc: 250…1375Ω • 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: 1000Vac/1500Vdc
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…1.5kHz, 5 to 8: 0…150Hz.
Additional I/O	
I/O Expansion	Supported modules: • 6601 external module Maximum number of modules per unit: • SCADAPack 530E: 16 (*) • SCADAPack 535E: 15 (*) (*): to reach this limit, additional power supply modules are required

Product Data Sheet SCADAPack 530E | 535E
Model Code

	SCADAPack 530E/535E
Model	**Select: Controller**
TBUP530	SCADAPack530E, 32-bit controller, Dual Core
TBUP535	SCADAPack535E, 32-bit controller, Dual Core, comes with additional I/O
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**
6	Full DNP3 Data Concentrator License, Multiple DNP3 Master License (up to 3 Masters)
Code	**Select: Analog Inputs**
A	P530: None P535: adds 6, shipped selectable as 0-20mA or 4-20mA
B	P535 only: adds 6, shipped selectable as 0-5V or 1-5V
Code	**Select: Digital Inputs/Outputs**
A	P530: 2 Digital Inputs (12/24V), 1 Digital Output (open collector)
B	P535: 16 Digital Inputs (12/24V) 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 4-20mA, external DC supply
Code	**Select: Integrated Communication Interfaces**
0	None
Code	**Select: Certifications**
S	With FCC, UL508, CE marking and RCM
U	Adds cCSAus Nonincendive Electrical Equipment for use in Class I, Division 2, Groups A, B, C and D
X	Adds IECEx/ATEX Class I, Zone 2
I/O Expansion Modules (Supported by SCADAPack 530 & 535 Controllers only)	
Part No.	**Expansion Modules** **(complete the following part numbers with S, U or X depending on certification required)**
TBUX297583___	Model 6601-20mA, 16 D/I 12-24 volts, 10 Dry Contact relay O/P, 6 config. A/I (0/4-20mA)
TBUX297584___	Model 6601-5V, 16 D/I 12-24 volts, 10 Dry Contact relay O/P, 6 config. A/I (0/1-5V)
TBUX297585___	Model 6601-20mA, 16 D/I 12-24 volts, 10 Dry Contact relay O/P, 6 config. A/I (0/4-20mA), 2 A/O (external DC supply)
TBUX297586___	Model 6601-5V, 16 D/I 12-24 volts, 10 Dry Contact relay O/P, 6 config. A/I (0/1-5V), 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 master, managing up to 15 SCADAPack ES slave units: SCADAPack 535E automatically downloads the corresponding configuration into these slave devices (which is very useful when replacing devices, as the operator does not have to do any firmware setting).