

SCADAPack³⁵⁰ | 357

Features:

- High performance 32-Bit processor
- 10/100BaseT Ethernet port
- Two USB 2.0 compliant ports (host and peripheral)
- Configurable power saving modes (15mW in sleep mode)
- Three serial ports (RS-232, RS-485, RS-232/RS-485)
- Optional 5606 lower I/O module
- Optional integrated spread spectrum radio
- 2 or 4 run custody flow computer using RealFLO 6
- Support for 32 independent C/C++ applications
- cULus Class I, Division 2 Hazardous Area Rating
- 3-year warranty on parts and labor.



The Control Microsystems SCADAPack^{350/357} represents a quantum leap in programmable logic controller performance and flexibility. As the latest member of the SCADAPack PLC series, the SCADAPack^{350/357} combines high-performance 32-bit processing with high speed LAN and USB communication and advanced power-saving features. Additionally, the product has an integrated power supply, 12 to 24VDC converter, analog and digital I/O, serial communication capabilities, and turbine flow meter counter inputs. The SCADAPack^{350/357} uses industry-standard Modbus and DNP3 serial protocols as well as Modbus TCP and UDP-based Ethernet protocols, and can be programmed locally or remotely through a choice of flexible programming languages.

Overview:

Compact and Powerful - The SCADAPack^{350/357} Programmable Logic Controller provides Remote Terminal Unit (RTU) functionality with flexible programming options. The unit is programmable in either TelePACE Relay Ladder Logic or the IEC 61131-3 family of languages and provides sophisticated control functionality such as flow calculation and PID control. Additionally, up to 32 independent C/C++ applications can be loaded, executed and deleted in parallel with standard controller logic to provide maximum flexibility and performance. The central processing unit includes a 32-bit microprocessor with 16MB FLASH ROM, and 4MB CMOS RAM for use in firmware and application programming. Custom power-saving features include multiple configurable power modes, Sleep Mode, 24V power shutdown as well as serial/LAN/USB port and clock frequency power consumption control. The basic SCADAPack³⁵⁰ comes with 6 analog inputs, 8 digital inputs/outputs, 3 counter inputs (including two turbine meter

inputs) and 2 optional analog outputs. With the addition of the optional 5606 lower I/O module, the SCADAPack³⁵⁷ features an extra 32 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs are available; and support for Control Microsystems Series 5000 I/O expansion modules further increases the controller's I/O capacity and versatility. With all these features, the SCADAPack^{350/357} is the right controller for a wide variety of process control and metering connections.

Flexible Communications - As with all SCADAPack controllers, the SCADAPack^{350/357} offers a variety of communication modes making it one of the most communication-rich controllers on the market. New to Control Microsystems controllers are USB ports. The SCADAPack^{350/357} includes two USB2.0 compliant ports providing low speed (1.5MB/s) and full speed (12MB/s) communication: a peripheral port to connect the SCADAPack^{350/357} to PC-based applications, and a powered host port to attach third-party hardware such as mass storage devices (memory sticks). One RS-485, one RS-232/485 and one RS-232 serial communication port offers Modbus RTU, Modbus ASCII and DNP3 communication protocols. For applications requiring high-speed Ethernet LAN or WAN communication, a fully integrated 10/100BaseT Ethernet port furnishes Modbus/TCP, Modbus RTU/ASCII in UDP, DNP in TCP, DNP in UDP and ICMP (ping). For those challenging remote applications, a fully integrated, license-free spread spectrum wireless module is available at 900 MHz and 2.4 GHz. The SCADAPack^{350/357} also supports external radios and dial-up modem communication.

Applications and Benefits:

The SCADAPack^{350/357} is designed with power conservation in mind. It's a natural

choice for applications that require low power operation in tandem with a varied mix of analog and digital I/O as well as multiple communication ports. Coupled with real-time communications using industry-standard Modbus and DNP protocols, the SCADAPack^{350/357} integrates easily with Control Microsystems' ClearSCADA SCADA management software and Vision series of operator interface terminals, as well as a wide range of third-party SCADA software, MMIs, DCS systems, intelligent instrumentation and remote I/O control applications.

A flexible controller that can be used in both Modbus master and slave configurations, the SCADAPack^{350/357} supports report-by-exception and store and forward messaging and can also make the most of DNP's advanced protocol functionality, including maintenance polling, unsolicited messaging and data-backfilling. For oil and gas applications, the RealFLO SCADAPack^{350/357} flow computer furnishes two or four run custody transfer options. In the water and wastewater sector, the SCADAPack^{350/357} is well suited for use in lift and pump stations, dam control systems and environmental monitoring solutions. In solar panel-powered applications the SCADAPack^{350/357} offers further cost reduction by allowing smaller solar panels and batteries to be used. The integrated DC/DC converter and overall small footprint also enables the use of compact mounting enclosures for those applications where space is at a premium.

Similar in manufacture to all SCADAPack products, the SCADAPack^{350/357} has conformal coating, gold-plated machined sockets and zinc-plated steel system components. Regardless of the specific need, the SCADAPack^{350/357} can provide reliable and compact stand-alone performance in the hazardous environments so often found in SCADA applications.

Specifications (P350: 5209 controller board only)

Controller	
Processors	CPU: 32-bit ARM7 microcontroller, 32 MHz clock, integrated watchdog timer Two Microcontroller co-processors, 20 MHz clock
Memory	4 MB SRAM, 16MB flash ROM
Non Volatile	CMOS SRAM with lithium battery retains contents for 2 years with no power
Datalog Capacity	465k words
I/O	
Analog Inputs	5, user selectable 0-10V (15-bit) or 0-20mA (14-bit) 1, 0-32.7VDC (15-bit)
Analog Outputs	Standard: None 2, 0-20/4-20mA (12-bit) with optional 5305
Digital I/O	8, user selectable as dry contact inputs or open drain outputs
Counter Inputs	1, 0-10Hz (dry contact) 2, 0-10kHz (turbine or dry contact)
Communications	
Serial Port COM1	RS-485 port, 2-pole removable terminal block, 2-wire, half duplex
Serial Port COM2	RS-232 port, 8-pin modular RJ45 jack, full or half duplex RS-232, or RS-485 port, 2-wire, half duplex
Serial Port COM3	RS-232 port, 8-pin modular RJ45 jack, half duplex with RTS/CTS control and Vision OIT power control
Baud Rates	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200
Serial Protocols	Modbus RTU, Modbus ASCII, DNP3, DF1
Serial Protocol Modes	Slave, Master, Master/Slave, Store and Forward
Ethernet Port	RJ45, 10/100BaseT
Ethernet Protocols	Modbus TCP, Modbus RTU in UDP, Modbus ASCII in UDP, DNP in TCP, DNP in UDP
Network Protocols	IP, ARP, TCP, TFTP, UDP and ICMP
USB Host Port	USB 2.0 compliant "A"-type receptacle, provides up to 100mA at 5V
USB Peripheral Port	USB 2.0 compliant "B"-type receptacle
Wireless¹	Spread spectrum radio at 900MHz ² and 2.4GHz ²
General	
I/O Terminations	6 and 12- pole removable terminal blocks, 12 to 22AWG, 15A contacts
Dimensions	8.40 inch (213mm) wide, 5.00 inch (127mm) high, 1.80 inch (45mm) deep
Packaging	Corrosion resistant zinc-plated steel with black enamel paint
Environment	5% RH to 95%, non-condensing, – 40°F (– 40°C) to 158°F (70°C)
Power Input	11 - 30VDC, 12mW at 12V during Sleep 510mW at 12V during normal operation. 32MHz., LEDs off, no expansion, LAN and USB disabled. 275mW at 12V during normal operation. 8MHz., LEDs off, no expansion, LAN and USB disabled. (Reduced power mode) 1.2W at 12V during normal operation. 32MHz., LEDs off, no expansion, LAN enabled and USB disabled. Add 25 to 100mW when enabling the LEDs. 12W at 24V maximum. 5V supply fully loaded and Vloop on and boosted, fully loaded
Voltage Converter	12VDC to 24VDC
Warranty	3 years on parts and labor

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

² Not applicable in all countries.

Specifications (P357: 5209 controller board and integrated 5606 I/O board)

Controller	
Processors	CPU: 32-bit ARM7 microcontroller, 32 MHz clock, integrated watchdog timer Two Microcontroller co-processors, 20 MHz clock
Memory	4 MB SRAM, 16MB flash ROM
Non Volatile	CMOS SRAM with lithium battery retains contents for 2 years with no power
Datalog Capacity	465k words
I/O	
Analog Inputs	5, user selectable 0-10V (15-bit) or 0-20mA (14-bit) 1, 0-32.7VDC (15-bit) ; 8, 0-20/4-20mA / 0-5/0-10V (15-bit) software configurable
Analog Outputs	Standard: None 2, 0-20/4-20mA (12-bit) with optional 5305 on 5209 controller board 2, 0-20/4-20mA (12-bit) with optional 5305 on 5606 I/O board
Digital I/O	8, user selectable as dry contact inputs or open drain outputs 32, 12/24V, 48V, 115/125V, 240V digital inputs; 16, dry contact relay outputs
Counter Inputs	1, 0-10Hz (dry contact); 2, 0-10kHz (turbine or dry contact)
Communications	
Serial Port COM1	RS-485 port, 2-pole removable terminal block, 2-wire, half duplex
Serial Port COM2	RS-232 port, 8-pin modular RJ45 jack, full or half duplex RS-232, or RS-485 port, 2-wire, half duplex
Serial Port COM3	RS-232 port, 8-pin modular RJ45 jack, half duplex with RTS/CTS control and Vision OIT power control
Baud Rates	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200
Serial Protocols	Modbus RTU, Modbus ASCII, DNP3, DF1
Serial Protocol Modes	Slave, Master, Master/Slave, Store and Forward
Ethernet Port	RJ45, 10/100BaseT
Ethernet to Serial Gateway¹	RJ45, 10BaseT
Ethernet Protocols	Modbus TCP, Modbus RTU in UDP, Modbus ASCII in UDP, DNP in TCP, DNP in UDP
Network Protocols	IP, ARP, TCP, TFTP, UDP and ICMP
USB Host Port	USB 2.0 compliant "A"-type receptacle, provides up to 100mA at 5V
USB Peripheral Port	USB 2.0 compliant "B"-type receptacle
Wireless¹	Spread spectrum radio at 900MHz ² and 2.4GHz ²
General	
I/O Terminations	5, 6, 9, 10 and 12-pole removable terminal blocks, 12 to 22AWG, 15A contacts
Dimensions	8.40 inch (213mm) wide, 6.13 inch (155mm) high, 2.80 inch (72mm) deep
Packaging	Corrosion resistant zinc-plated steel with black enamel paint
Environment	5% RH to 95%, non-condensing, - 40°F (- 40°C) to 158°F (70°C)
Power: 5209 Controller Board:	11 - 30VDC, 12mW at 12V during Sleep 510mW at 12V during normal operation. 32MHz., LEDs off, no expansion, LAN and USB disabled. 275mW at 12V during normal operation. 8MHz., LEDs off, no expansion, LAN and USB disabled. (Reduced power mode) 1.2W at 12V during normal operation. 32MHz., LEDs off, no expansion, LAN enabled and USB disabled. Add 25 to 100mW when enabling the LEDs. 12W at 24V maximum. 5V supply fully loaded and Vloop on and boosted, fully loaded.
Power: 5606 I/O Module:	11 - 30VDC; 600mA (max.) at 5V required from 5209 controller board 12mA plus analog outputs
Voltage Converter	12VDC to 24VDC
Warranty	3 years on parts and labor

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

² Not applicable in all countries.

Model Code

P357-1A00-AA00 represents a sample code for a SCADAPack³⁵⁷, 5606 I/O board and Modbus protocol emulation

Model	Select: Controller
P350	SCADAPack ³⁵⁰ comes with 5 Analog Inputs, 8 configurable Digital I/O, 3 Accumulators
P357	SCADAPack ³⁵⁷ , with Model 5606 I/O board, comes with above I/O plus 8 AI, 32 DI and 16 DO
Code	Select: Communication Ports
1	6 Communication Ports: 2 RS232 (RJ45), 1 RS485 (2 wire Terminal Block), 2 USB (A & B Type), 1 Ethernet (RJ45)
Code	Select: Memory Configuration
A	16MB FLASH ROM, 4MB CMOS RAM (3MB OS, 1MB dynamic allocation)
Code	Select: Protocol Option
0	Modbus protocol emulation
1	Modbus and DF1 protocol emulation
2	Modbus and DNP 3.0 (Level 2) protocol emulation
Code	Select: Programming Environment
0	TelePACE Ladder Logic and C Language firmware loaded - IEC 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	P350: 5 selectable as 0-10V or 0-20mA inputs. P357: adds another 8 selectable as 0-20, 4-20mA, 0-5V or 0-10V
Code	Select: Digital Inputs/Outputs
A	P350 - 8 configurable Digital I/O, individually selectable as DI (Dry Contact) or DO (Open Drain)
B	P357 - 8 configurable Digital I/O (see P350) plus 32 DI (12/24V) and 16 DO on 5606 I/O board
C	P357 - 8 configurable Digital I/O (see P350) plus 32 DI (48V) and 16 DO on 5606 I/O board
D	P357 - 8 configurable Digital I/O (see P350) plus 32 DI (115/125V) and 16 DO on 5606 I/O board
E	P357 - 8 configurable Digital I/O (see P350) plus 32 DI (240V) and 16 DO on 5606 I/O board
Code	Select: Analog Outputs
0	None
1	P350 or P357 - 2 channel analog output option, 0 - 20mA (P357 - 2 channel A/O option on the 5606)
2	P357 only - 4 channel analog output option, 0 - 20mA (consists of the 2 channel A/O option board on both modules)
Code	Select: Integrated Communication Interfaces
0	None
1	900MHz Freewave Spread Spectrum Radio *Not available in all areas – Consult CMI for availability in your market area
A	900MHz MDS Spread Spectrum Radio *Not available in all areas – Consult CMI for availability in your market area
2	2.4GHz FreeWave Spread Spectrum Radio *Not available in all areas – Consult CMI for availability in your market area