Datasheet **RCL-PFC** Series

LONMARK® Certified Powered Fan Coil Configurable Controllers



Applications

Meets the requirements of the following applications:

- Fan Coil Units
- Unit Ventilators
- Chilled Ceilings
- Small Air Handling Units
- Lighting and Sunblinds when associated to RCx add-on modules

Improves energy efficiency when combined with:

- Motion detectors to automatically adjust a zone's occupancy mode from standby to occupied when presence is detected
- CO₂ sensors as part of a demand-controlled ventilation strategy that adjusts the amount of fresh air intake according to the number of building occupants
- Window-contact sensors

Works with a wide range of sensors and actuators

Features & Benefits

- Easily configurable using LNS-based plug-ins or EC-Net^AX-based wizards, allowing you to work with your preferred network management platform
- Most advanced yet cost-effective solution for addressing any terminal unit application, eu.bac certified (RCL-PFC-207 only)
- Expandable with lighting and sunblinds add-on modules for unprecedented adaptability
- Smart cross-management of HVAC, lighting and sunblinds as a whole for up to 45% energy savings
- LONMARK certified according to the Interoperability Guidelines Version 3.4
- A single point on the network for the main HVAC controller and its associated add-on modules, leading to easier BMS integration
- Optional strain relief and terminal block cover for flexible installation, in ceilings, closed to lighting and sunblind devices, or directly on HVAC equipments, to reduce wiring costs and expand installation possibilities
- Separable connectors, allowing to start on-site wiring while engineering is done at the office
- DIN rail mounting integrated into the enclosure for fast and reliable installation

The RCL-PFC Series are microprocessor-based configurable controllers designed to control a wide variety of terminal units such as powered fan coil units, unit ventilators, chilled ceilings and small air handling units.

This series can command up to 4 lights and 4 sunblinds through RCx modules. These are add-on modules that operate off of a separate sub-bus, giving this controller the ability to manage lighting and sunblinds for a full cross-management solution forming a single point on the network. These controllers use the LonTalk® communication protocol and are LONMARK® certified as SCC Fan Coil controllers.

This series contains four models as follows: RCL-PFC-107, RCL-PFC-108, RCL-PFC-207 and RCL-PFC-208. The RCL-PFC Series supports various input types including sensor, pulse, and digital-based ones. Moreover, they provide analog, floating, and proportional control outputs for valves, heating elements and fans.

These sensors are used for indoor temperature measurement, setpoint adjustment, fan speed selection, and occupancy state override, as well as light and sunblinds management for a complete cross-management integration.

Each controller can be configured using LNS®-based plug-in or the EC-Net^{AX™} wizard, powered by the Niagara^{AX} Framework[®]. Either way, a configuration interface exists that simplifies the setup of HVAC and lighting and sunblinds applications through an intuitive menu-based user interface.

	Transie - Transie		nnoony	
Model	RCL-PFC-107	RCL-PFC-108	RCL-PFC-207	RCL-PFC-208
Points	12-Point Controller	12-Point Controller	14-Point Controller	14-Point Controller
Configurable inputs	6	6	6	6
Electric Heater outputs	1	1	1	1
Analog output 0-10 V			2	2
Fan outputs	3	3	3	3
PWM Valve outputs 230 VAc	2		2	
PWM Valve outputs 24 V		2		2
24 VAc Generation 7 VA				
Expandable with lighting & sunblinds add-on modules				

Recommended Applications

Model	RCL-PFC-107	RCL-PFC-108	RCL-PFC-207	RCL-PFC-208
FCU ¹ : 2/4 pipes - 3-speed fan - On/Off / thermal valves 230VAC				
FCU: 2/4 pipes - 3-speed fan - On/Off / thermal valves 24VAC				
FCU: 2/4 pipes – 3-speed/variable speed fan - On/off / thermal valves 230VAC				
FCU: 2/4 pipes - 3-speed/variable speed fan - On/off / thermal valves 24VAC				
FCU: 2/4 pipes - Variable / 3-speed fan - Analog actuator				
FCU: 2 pipes - Variable / 3-speed fan - Floating actuator				
Chilled Beam: On/Off / thermal valves				
Chilled Beam: 2 pipes - Floating actuator 230 VAC				
Chilled Beam: 2 pipes - Floating actuator 24 VAC				- 1 - 1

1. Fan Coil Unit

Accessories - RIR Series



Line of in-ceiling receivers series for infrared remote controls. Models available in white, with or without light sensor, or translucent.

Inputs Configuration Table

Assignable Input Functions	DI1	DI2	SI3	DI4	AI5	DI6
Window						
Presence						
Dewpoint						
Changeover						
Auxiliary contact						
Flow switch						
Alarm						
Analog input						
Counter 1						
Counter 2						
Counter 3						
Room temperature - 10K Type Z						
Room temperature - 10K Type II						
Return Room temperature - 10K Type Z						
Return Room temperature - 10K Type II						
Room temperature with occupancy reinitialization push button and LED indicator - 10K Type II						
Room temperature with occupied/unoccupied push button and LED indicator - 10K Type II						
Discharge air temperature - 10K Type Z						
Discharge air temperature - 10K Type II						
Setpoint offset - 0-5V						
Setpoint offset - 10K rotary potentiometer						
Fan speed selector - 0-5V						
Fan speed selector - 10K rotary potentiometer						

Supported Platforms



, EC-Net^{AX}

EC-Net^{Ax} is a web-enabled multi-protocol integration solution powered by the Niagara^{Ax} Framework, establishing a fully Internet-enabled, distributed architecture for real-time access, automation and control

of devices. EC-Net^{AXI}s open framework creates a common development and management environment for integration of LonWORKS®, BACnet® and other protocols. Regardless of manufacturer and protocol, the EC-Net^{AXI} system provides a unified modeling of diverse systems and data, providing one common platform for development, management and enterprise applications.

EC-Net^{AX} Wizards and LNS Plug-Ins



Designed for use respectively with EC-Net^{AX} (powered by the Niagara^{AX} Framework) or LNS-based softwares such as Distech Controls' Lonwatcher 3, the EC-Net^{AX} Wizards and LNS plug-in can be used to easily configure a device's parameters including inputs, outputs, fan and valve settings, heating and cooling setpoints, amongst others. a well as all the connected add-on modules' parameters

and monitor controllers and devices in the control system.

LONWORKS Network Services (LNS)

directory, installation, management, monitoring and control services for the

network system being managed. Distech Controls' Lonwatcher is an example

of a LNS-based network management tool that can use Plug-Ins to configure

LNS® is a client-server platform that allows

multiple users, running different LNS-compatible

applications, to access a common source for

- User-friendly interface to easily and efficiently configure the controller's parameters
- One wizard only for the controller and its associated add-on modules

LNS

TURBO Edition

- Powerful import/export functionalities to duplicate a controller's settings for reuse
- Download configuration to multiple devices for large BMS integration

Configuration Softwares

EC-Net^{AX}



EC-Net^{AX} is a suite of Niagara^{AX}-based products designed to integrate diverse smart devices into a unified, Internet-enabled, web-based system. EC-Net^{AX} solutions integrate LONWORKS[®], BACnet[®], oBIX, Internet and web services protocols in a software platform that can be used in embedded controllers or server applications.

EC-Net^{Ax} includes integrated network management tools to support the design, configuration, installation, and maintenance of interoperable networks.

- Connects to almost any embedded device, regardless of manufacturer or communication protocol, as a result the common environment created by Niagara^{AX}'s open Java-based Framework.
- Includes a comprehensive, graphical toolset that enables users to build rich applications in a drag-and-drop environment. By wiring components together, developers build control strategies, alarming and scheduling applications as well as browser-based displays and reports.
- Reduces development time by merging automation, IT and Internet technologies in a single solution. With an EC-BOS^{AX}, advanced web-services applications, such as TCP/IP, HTTP, XML, SOAP, and oBIX, can be implemented so that you can read data, send commands, and respond to alarms in real-time from anywhere using any standard web browser.
- Integrates geographically dispersed, multi-vendor devices into an interoperable application to save time and money.

LonWatcher 3



The Lonwatcher 3 network management tool is an innovative software for fast set-up and cost efficient implementation of the Distech Controls' LONWORKS products, as well as other multivendor open and interoperable LONWORKS networks, and their interaction. This intuitive yet sophisticated tool provides network integrators with advanced features and all the resources necessary to install, operate and maintain LONWORKS networks. Based on LNS TURBO Edition network operating system, Lonwatcher 3 is a performance-driven, highspeed application, allowing a fast response time from the application and increasing user productivity.

- Build, commission and maintain multi-vendor, open and interoperable LONWORKS networks.
- Manage multiple LONWORKS networks simultaneously.
- Batch operations to copy/paste multiple networks, subsystems and devices reducing time for commissioning, replacing and loading devices.
- Compatible with other LNS® databases created with any LNS network management tool.
- Supports LNS standard plug-in applications, allowing for easy integration of Distech Controls devices as well as other manufacturers' devices.
- Create device status reports to get information such as devices in override, in alarm, etc.
- Fully supports i.LON[®] Internet Servers.
- Create dynamic network variables.
- User Manager, to prevent unauthorized system access, and to manage user rights.
- Support of any LNS or IP network interfaces.

The PFC Solution combines a main HVAC Controller with add-on modules dedicated to lighting and sunblinds management to form a modular solution within a single point on the network.



RCL-PFC Series

Complementary Products

Lighting and Sunblinds Add-On Modules

Line of lighting and sunblind add-on modules for PFC Series controllers: On/Off lights, dimmming lights, 230 VAC sunblinds, 24 VDC sunblinds.

EC-Remote Remote Controls Series

Line of infrared remote controls for the control of occupancy, lighting, sunblind, temperature and fan speed. Models available with temperature sensor and wall-mounted stand.

Room Modules

Allure EC-Sensor

Line of discrete temperature sensors. Models are available with the following options: communication jack, occupancy override button, setpoint adjustment, and fan speed selection.

Allure Wireless Battery-less ECW-Sensor Series

Line of wireless, battery-less room temperature sensors. Models are available with the following options: occupancy override button, setpoint adjustment, and fan speed selection. These sensors are available in EnOcean 868.3MHz. The controller must be equipped with a Wireless Receiver.

RS-ANA Series

Analog room temperature sensors with or without setpoint adjustment.

RS-DL Series

Line of digital and LCD room temperature sensors. Models available with setpoint adjustment, occupancy override button, fan speed selection, and LCD screen for HVAC, lighting and sunblinds control.

In-Ceiling Multi-Sensors

MS2 Series

Line of in-ceiling infrared multi-sensors. Models are available with presence detection, light sensor, and temperature sensor.

Product Specifications

Bower		Inpute	
Power Vieles as		Desisting	
Voltage	230 VAC ; 50/60 Hz ; +10%/-15%	Resistive	$10 \text{ k}\Omega$ Type 2, Type 2 NTC (max cable length 3 m)
Protection	Self-protected Transformer	A 1	Accuracy: $\pm 0.2^{\circ}C$ @ 20°C (controller only)
Power Consumption	30 mA + all external loads	Analog	RCL-10X : 0 to 5VDC (60KΩ input impedance)
RCL_PEC_107/207			RCL-20x : 0 to 10VDC (60kΩ input impedance)
PCL PEC 108/208		Digital	Dry Contact c_{1}
NCE-F1 C-100/200.	3.3 A maximum		- open contact treshold > 3 V
	Double insulation devices		- impedance < 660 Ω - max cable length 100m (30ft)
Interoperability		Outputs	
Communication	LONTALK Protocol	Analog (AO7 & AO8)	0-10 VDC
Channel	TP/FT-10; 78 Kbps		2 mA max
LONMARK Interoperability Guidelines	Version 3.4	Digital Relay Contacts	Typically Fan Speeds
Device Class	SCC - Fan Coil	(DO1, DO2 & DO3)	230 VAC
LONMARK Functional Profile			3 A max (total)
- Output Objects	SCC Fan Coil #8501		All share the same common
- Node Object	Node Object #0000	Digital Relay Contact	Typically Heater
- Lamp Object	Lamp Actuator #3040	(DO6-C6)	230 VAC
- Sunblind Object	Sunblind Actuator #6110	(20000)	10 A - 2 kW
Hardware			Cycle time adjustable from 100 to 250 s
Processor	AVR32 MCU, 32 bit ; 60 MHz		Dedicated Common
Memory	256 kB Non-volatile Flash	Digital (DO1 & DO5)	
	32 kB RAM		220 VAC Trips digital (ON/OFF) DWM or floating
Environmental		RGE-PFG-107/207	230 VAC ITTAC, digital (ON/OFF), PWW of itoating
Operating Temperature	+5°C to 45°C		- 1 A continuous for each output
Storage Temperature	-20°C to +70°C		- 3 A starting current for each output
Relative Humidity	+20% to +90% Non-condensing		- PWW control adjustable from 20 to 250 s
Altitude	< 2000 m		- Floating control: requires two outputs
Enclosure			- Adjustable drive time period
Material	FR/ABS		1 common per pair of ouputs
Color	Blue casing & grey connectors	RCL-PFC-108/208	24 V Triac, digital (on/off), PWM, or floating;
Dimensions (with screws)	$132 \times 111 4 \times 44.5 \text{ mm}$		See on-board power supply for voltage and
Shinning weight	102 X 111,4 X 44.0 min		current specifications
BCL-PEC-107	470 g (1 03lb)		1 common per pair of outputs
	$630 \neq (1.38lb)$		- PWM control: Adjustable pariod from 20 s to 250 s
	$470 \approx (1.03 \text{ b})$		- Floating control:
	$630 \neq (1.38lb)$		- Requires 2 consecutive outputs
Installation	Direct din rail mounting or wall mounting		- Adjustable drive time period
On Reard Revers Surrahy (ROL RE		24 VAC Output	See on-board power supply
Una Chi-Board Power Supply (RCL-Pro	C-108 & RCL-PFC-208 Only)		
056	and 24 VAC outputs		
Voltage	24 VAC; -15%/+35% ; 50 Hz		
Current	- 300 mA max. on a resistive load		
	(7 VA @ 24 VAC) - Peak current 1 A max.		

RCL-PFC Series

Room Devices		Electromagnetic Comp	atibility		
Supported Room Devices	MS2 Series RIR Series RS Series WMS-PB-08DI	CE - Emission E C E	EN 61000-6-1: Generic standard for residential, commercial and light-industrial environments		
			EN 61000-6-2: Generic standard for industrial environments		
Number of devices per controller		CE - Immunity	EN 61000-6-3: Generic standard for residential, commercial and light-industrial environments		
			EN 61000-6-4: Generic standard for		
Cable	RJ9/RJ9 Cable, 50 m max.	Electrical Safety			
		General requirements	EN 60730: Specification for automatic electrical		
Extension Modules (RCx Series)		CE	controls for household and similar use.		
Communication	RJ9/RJ11				
Number of extension modules per	Up to 4 Lightings + 4 Sunblinds controlled in daisy-chain configuration	Agency Approvals	/ Approvals		
controller		Material	UL94-5VA		
		Communication Protocols and Standards			
		LonMar	3K°		
		RCL-PFC-207 Certified Performances			
		eu.bac license number	212213		
		Cooling Control Accuracy	/ (CA) 0.1°C (4 pipes)		
			0.2 °C (2 pipes+electric heater)		
		Heating Control Accuracy	(CA) 0.2°C (4 pipes and 2 pipes+electric heater)		
		RCL-PFC-208 Certified Performances			
		eu.bac license number	213271		
		Cooling Control Accuracy	(CA) 0.2 °C (2 pipes+electric heater)		
		Heating Control Accuracy	(CA) 0.2 °C (2 pipes+electric heater)		
		eu. bac			

1. All materials and manufacturing processes comply with the RoHS directive **views** and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive **view**.

	SCC-Fancoil Object type#8501					
nviSpaceTemp	Mandatory Network Variable	nvoSpaceTemp				
/ SNVT_temp_p		SNVT_temp_p	\sim			
		SNVT_hvac_status				
nviApplicMode	Optional Network Variable	nvoDischAirTemp				
SNVT_hvac_mode	<	SNVT_temp_p	\prec			
SNVT_switch	\prec	SNVT_occupancy				
SNVT_switch	_>	SNVT_temp_p	_>			
NVIOccCmd SNVT_occupancy	>	NV0EnergyHoldOff SNVT_switch	>			
NVIOccSensor	< <u> </u>	NV0FanSpeed	$ \rightarrow $			
nviSetpoint	<	nvoHeatCool	\sim			
SNVT_temp_p nviSetptOffset	<	nvoSpaceCO 2	\sim			
SNVT_temp_p	<	SNVT_ppm	\sim			
SNVT_ppm	>	SNVT_lev_percent	>			
	Manufacturer Network Variat	bles				
SNVT_switch	_>	SNVT_switch	_>			
nviCounterInit # (# = 1 to 3) SNVT_count	>	NvoAnalogInput SNVT_switch (chan	geable type			
nviDewPtSensor	<	nvoAuxContact	\leq			
nviEcoVue	<	nvoChgOver	\sim			
SNVT_switch	<	SNVT_switch	10.31			
SNVT_switch	~	SNVT_count				
<pre>nviLightCmd_# (# = 1 to 4) SNVT_switch</pre>	>	> nvoDew Pt Sensor SNVT_switch	$_{-}>$			
> nviLightControl	~	VINVT energy and	ency 2			
nviLightOvr_# (#= 1 to 4)	<	nvoElecRunHours				
SNVT_switch	<	SNVT_count	$ \rightarrow$			
SNVT_lux	~	SNVT_switch	_>			
> nviOutdoorCO 2 SNVT_ppm	>	NVOFIOW Status SNVT_switch				
nviOverrideAO7		nvoLampValue _# (#	#= 1 to 4)			
nviOver rideAOB	r	SNVT_switch	\sim			
SNVT_switch (changeable ty	pe	SNVT_setting				
NVICverrideDO4 SNVT_switch (changeable ty		> nvoLightLevel SNVT_lux	$ \ge $			
NVI switch (changeshie ty		NvoPresence	$ \rightarrow $			
nviOver rideDO6	\leq	nvoSbindControl	$-\!\!<$			
SNVT_switch (changeable ty	Pe	SNVT_setting				
SNVT_occupancy	~	SNVT_setting				
<pre>nviSbIndCmd_# (# = 1 to 4) SNVT_setting</pre>	>	NvoSetptOffset SNVT temp p	\sim			
NviSbindControl	~	nvoWindow Contact	\leq			
	<	switch	$ \longrightarrow $			
SNVT_setting	<	SNVT_switch				
UNVT_Dalilon	~					
NVT_switch	>					
NviWaterTemp	\geq					
nviWindowContact	\leq					
SNVT_switch	Mandatory Configuration Pro	nerties				
\	nciSetpoints (SCPTsetPnts)	,por des				
	cpMaxSendTime (SCPTmaxSend	Time)				
	Manufacturer Configuration P	roperties				
	nciLuxSetpoint (SCPTluxSetpoint) cp6WayValveCfg (UCPT6WayValv	eCfg)				
	cpDewPointHoldTime (UCPTdewP cpDischAirCfg (UCPTdischAirCfg)	pintHoldTime)				
	cpEquipType (UCPTequipType) cpFrostProtectionSetpt (UCPTfrost	ProtectionSetpt)				
	cpFanCfg (UCPTfanCfg) cpHVACScaling (UCPThvacScaling	1)				
	cpIAQCfg (UCPTiaqCfg) cpIAQDamper (UCPTiaqDamper)					
	cplnputCfg (UCPTinputCfg) cplntTime (UCPTintTime)					
	cpUghtCtrlSet (UCPTlightCtrlSet) cpOccCtrl (UCPToccCtrl)					
	cpOffsetDischTemp (UCPToffsetDi cpOffsetTemp (SCPToffsetTemp)	sch (emp)				
cpOffsetWarmUp (UCPToffsetWarmUp) cpOutputCfg (UCPToutputCfg)						
cpPropBand (UCPTpropBand) cpRelayCycleTime (UCPTrelayCycleTime)						
cpRcomDisplay (UCPTrcomDisplay) cpStateCfg (UCPTstateCfg)						
cpValveCycleTime (UCPTvalveCycleTime)						
nviFlowStatus Configuration Properties : cpFlowMaxRcvTime (SCPTmaxRcvTime)						
nviOver rideAO7 Configuration Properties :						
	cpNvTypeNviOverrideAO 7 (SCPTrvType) cpMaxNvLengthVviOverrideAO 7 (SCPTrmxNVLength)					
	nviOver rideAO8 Configuration P	roperties :				
cprv vypetvid/verrideA0 6 (SCPTrm Type) cpMastVLengthW/dverrideA0 8 (SCPTmastVLength) nviOver rideD04 Configuration Properties :						
cpNvTypeNvOverrideD0 4 (SCPTrnvType) cpMaxNvLengtNvVoverrideD0 4 (SCPTmaxNvLength) nviOver rideD0 5 Configuration Properties :						
cpNvTypeWideWideOG(SCPInPTUB) cpMawWidegNVOverrideOG(SCPInPTUB) cpMawWidegNVOverrideOG(SCPInPTUB)						
nvOverdideO 6 Configuration Properties : cpNvTypeNvOverideD 6 (SCPTmaxNvLength) cpMaxNvLengthNvOverideD 6 (SCPTmaxNvLength)						
nvWWaterTempConfiguration Properties : cpWaterTempCfg (UCPTwaterTempCfg)						
	nvoAnalogInput Configuration P cpNvTypeNvoAnalogInput (SCPTn cpMaxNvLengthNvoAnalogInput (S	roperties: vType) cCPTmaxNVLength)				
	nvoCounter€(# = 1 to 3) Configuration Properties : cpCounterClg #(UCPTcounterClg)					
nvoLampValue_# (# = 1 to 4)Configuration Properties : cpLiphtCHA(_UCPTIghtCHA(_UCPTIghtCHA(_)) cpLiphtn() cpLip						
	nvoLightLevel Configuration Properties : cpDisplayed/alue (UCPTdisplayed/value)					
nvoSbindSet, # (# = 11 o J Configuration Properties : cpSSindinii (UCPTstandint) cpSSindSrpSet (UCPTstindGrpSet)						

Total Quality Commitment

All Distech Controls product lines are built to meet rigorous quality standards. Distech Controls is an ISO 9001 registered company.

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