

Multipoint commercial heat-tracing control system

Product Overview

The DigiTrace ACCS-30 Advanced Commercial Control System is a multipoint electronic control and monitoring system for heat-tracing applications. These applications include commercial freeze protection, surface snow melting, roof & gutter de-icing, and flow and temperature maintenance.

The DigiTrace ACCS-30 system can control up to 260 circuits with multiple networked ACCS-PCM2-5 panels. The ACCS-PCM2-5 panel can directly control up to 5 individual heat-tracing circuits using electromechanical relays rated at 30 A up to 277 V. Four Resistance Temperature Detector (RTD) sensor inputs can be assigned for each heating cable circuit providing a variety of temperature control, monitoring, and alarm options. The ACCS-30 can be fitted with 16 DigiTrace RMM2s, providing an additional 128 temperature inputs to a maximum of 388 inputs.

Control

The DigiTrace ACCS-30 is pre-programmed with parameters for commercial hot water temperature maintenance, pipe freeze protection, flow maintenance, freezer frost heave prevention, surface snow melting, roof & gutter de-icing prevention and floor heating applications. The pre-programmed application settings significantly simplify setting up multiple heating cable circuits. Based on the application the DigiTrace ACCS-30 can be configured for On/Off, Ambient Sensing, Proportional Ambient

Sensing (PASC), and timed duty cycle control modes for HWAT applications.

The DigiTrace ACCS-30 measures temperatures with 3-wire, 100-ohm platinum RTDs connected directly to the unit, or through optional Remote Monitoring Modules (RMM2). Each RMM2 accepts up to eight RTDs. Multiple RMM2s are networked over a single cable to the DigiTrace ACCS-30, significantly reducing the cost of RTD wiring.

The built-in calendar function for hot water temperature maintenance, floor heating and greasy waste applications provides flexible timed set points providing energy savings.

Monitoring

To assist with energy management the ACCS-30 monitors the power consumption of each heating cable circuit. The DigiTrace ACCS-30 measures 12 control parameters including ground fault, temperature, and current to ensure system integrity. Configurable alarm settings provide options for local or remote alarms. The system can be set to periodically check for heating cable faults, alerting maintenance personnel of a pending heat tracing problem. This helps avoid costly downtime. Dry contact relays are provided for alarm annunciation back to a Building Management System (BMS).

Ground-Fault Protection

National electrical codes require ground-fault equipment protection on all heat-tracing circuits. The DigiTrace ACCS-30 controller has integrated ground-fault equipment

protection and therefore does not require additional ground-fault protection, simplifying installation and reducing costs.

Installation

The DigiTrace ACCS-30 system is configured with the User Interface Terminal (ACCS-UIT2) that has an LCD color display with touch-screen technology. The ACCS-UIT2 provides an easy user interface for programming without keyboards or cryptic labels. The ACCS-30 Program Integrator application tool is available to program, edit and download circuit parameters through the local USB port or from a remote location. The ACCS-UIT2 comes in a Type 4 enclosure suitable for nonhazardous, indoor or outdoor locations and comes complete with wiring terminals and an alarm signal light.

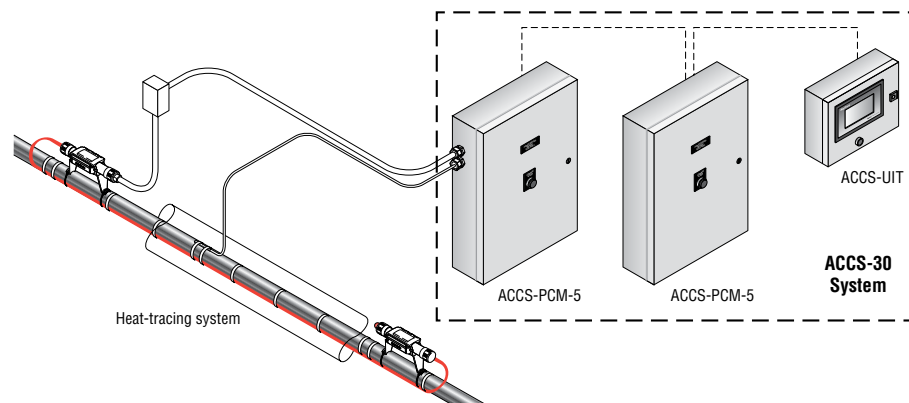
Communications

DigiTrace ACCS-30 units support the Modbus® protocol and are available with RS-232, RS-485 or 10/100Base-T Ethernet communication interface. DigiTrace ProtoNode multi-protocol gateways are available to integrate the ACCS-30 into BACnet®, Metasys® N2* and LonWorks® BMS systems.

Complete System

The DigiTrace ACCS-30 is supplied as a complete modular system, ready for field connections to convenient power distribution panels and temperature sensor input, reducing the cost of heating cable installation.

* Modbus, BACnet, Metasys N2 and LonWorks are trademarks of their respective owners.



ACCS-30 System

Multipoint temperature control with ground-fault/current/temperature monitoring when used with the ACCS-UIT2

The DigiTrace ACCS-30 is a multipoint electronic control, monitoring, and power relay system for heat-tracing cables used in commercial heat-tracing applications. The system consists of a DigiTrace ACCS-UIT2 and up to 52 ACCS-PCM2-5 power control panels. DigiTrace RMM2 heat-tracing remote monitoring modules may also be used with the ACCS-30 system to expand the number of temperature measurement points.

The DigiTrace ACCS-30 provides the following alarming features per control point.

- High/low temperature
- Ground fault
- High/low current fault
- RTD failure

The DigiTrace ACCS-30 provides ground-fault monitoring and protection for every heat-tracing circuit and fulfills the requirements of national electrical codes.

ACCS-30: Heating Cable Application Programming Summary

Control Mode Functions

Application	Heating cable	Control Mode	
Hot Water Temperature Maintenance	<ul style="list-style-type: none"> • HWAT 	<ul style="list-style-type: none"> • Preset power duty cycle (HWAT Design Wizard) 	<ul style="list-style-type: none"> • Constant temp • Variable schedule <ul style="list-style-type: none"> - Maintain - Economy - Off - Heat Cycle (R2 only)
Floor Heating	<ul style="list-style-type: none"> • RaySol • MI heating cable • QuickNet 	<ul style="list-style-type: none"> • Floor sensing 	<ul style="list-style-type: none"> • Constant temp • Variable schedule <ul style="list-style-type: none"> - Maintain - Economy - Off • Circuit override through RTD or external device
Greasy Waste Disposal and Temperature Maintenance	<ul style="list-style-type: none"> • XL-Trace 	<ul style="list-style-type: none"> • Line sensing 	<ul style="list-style-type: none"> • Constant temp • Variable schedule <ul style="list-style-type: none"> - Maintain - Economy - Off
Pipe Freeze Protection	<ul style="list-style-type: none"> • XL-Trace 	<ul style="list-style-type: none"> • Ambient, PASC or line sensing 	<ul style="list-style-type: none"> • Constant temp • Circuit override through external device
Fuel Oil Flow Maintenance	<ul style="list-style-type: none"> • XL-Trace 	<ul style="list-style-type: none"> • Ambient, PASC or line sensing 	<ul style="list-style-type: none"> • Constant temp • Circuit override through RTD or external device
Freezer Frost Heave Prevention	<ul style="list-style-type: none"> • RaySol • MI heating cable 	<ul style="list-style-type: none"> • Floor sensing 	<ul style="list-style-type: none"> • Constant temp • Variable schedule <ul style="list-style-type: none"> - Maintain - Off
Surface Snow Melting	<ul style="list-style-type: none"> • ElectroMelt • MI Heating Cable 	<ul style="list-style-type: none"> • Ambient or surface temp • External controller 	<ul style="list-style-type: none"> • Constant temp • External snow controller
Roof & Gutter De-icing	<ul style="list-style-type: none"> • IceStop • MI Heating Cable 	<ul style="list-style-type: none"> • Ambient or surface temp • External controller 	<ul style="list-style-type: none"> • Constant temp • External snow controller

Temperature Monitor Only

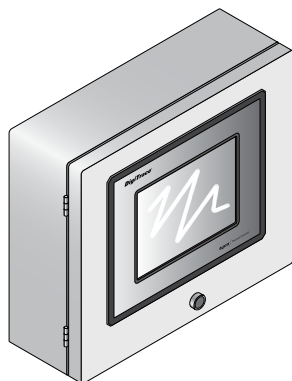
Five temperature monitor only channels
Low and high temperature alarms

Variable Schedule

Setpoint calendar with:



- 7 days/week calendar
- 48 - 1/2hr time blocks/day
- Daily schedule copy function

ACCS-UIT2 (User Interface Terminal)

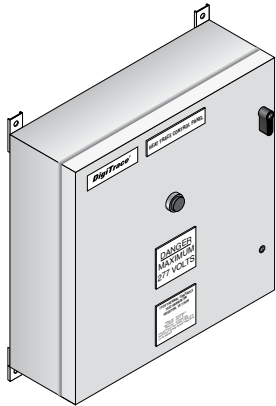


The DigiTrace ACCS-30 User Interface Terminal is a panel-mounted display for use with the ACCS panel. The ACCS-UIT2 has an 8.4 inch (21.7 cm) VGA color display with touch-screen technology, and provides an easy user interface for programming without keyboards or cryptic labels. It has RS-485, RS-232, or 10/100Base-T Ethernet communications ports that allow communication with external Distributed Control Systems or Building Management Systems. BACnet and LonWorks to Modbus protocol gateways with the Modbus registries pre-programmed are available. A USB interface is included for easy configuration and firmware upgrades.

The ACCS-UIT2 is designed for use on indoor or nonhazardous location installations and is rated for NEMA 4 environments.

General	
Approvals	<p>Nonhazardous Locations</p>  
Area of use	Nonhazardous, indoors and outdoors (IP65, Type 4)
Supply voltage	100 – 240 Vac +/-10%, 50/60 Hz
Operating temperature	-25°C to 50°C (-13°F to 122°F)
Supply terminal	26–12 AWG
Storage temperature	-25°C to 80°C (-13°F to 176°F)
Dimensions	386 mm W X 336 mm H X 180 mm D, (15.21 in. W X 13.21 in. H X 7.09 in. D)
Alarm Outputs	
Relay outputs	Three form C relays rated at 12 A @ 250 Vac. One relay used for common alarm light. Relays may be assigned for alarm outputs.
Network Connection	
Local port/remote	RS-232/RS-485 ports (RS-485, 2-wire isolated) may be used to communicate with host computers (ACCS-30 Program Integrator) or DCS.
Local RS-232	A non-isolated, 9 pin D sub male
Remote RS-485 #2	10 pin terminal block, 24–12 AWG, (0.2 mm to 2.5 mm ²) wire size
Data rate	9600 to 57600 baud
Maximum cable length	For RS-485 not to exceed 1200 m (4000 ft). Cable to be shielded twisted pair.
Field port	RS-485, 2-wire isolated. Used to communicate with external devices, such as ACCS-PCM2-5, ACCS-CRM, and RMM2. Maximum cable length not to exceed 1200 m (4000 ft). Cable to be shielded twisted pair.
Field RS-485 #1	10 pin terminal block, 24–12 AWG, (0.2 mm to 2.5 mm ²) wire size
Data rate	To 9600 baud
LAN	10/100 Base-T Ethernet port with Link and Activity Status LEDs
USB port	USB 2.0 Host port Type A receptacle (X2)
LCD Display	
Display	LCD is a 8.4 inch (21.7 cm) VGA, color TFT transfective device with integral CCFL backlight
Touch screen	4-wire resistive touch screen interface for user entry


ACCS-PCM2-5 Power Control Panel



The ACCS-PCM2-5 enclosure is rated NEMA 4/12 and is approved for nonhazardous indoor or outdoor locations. The ACCS-PCM2-5 provides ground fault and line current sensing, alarming, switching (electromechanical relays) and RTD inputs for five heat tracing circuits when used with the ACCS-UIT2.

ACCS-30 General (RPN P000001232) panels are available to satisfy special applications which require higher voltage, higher switching capacity, panel heaters, etc. Contact Tyco Thermal Controls at 1(800)545-6258 for design assistance.

General

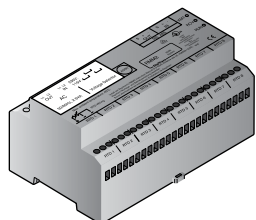
Approvals	Nonhazardous Locations	 UL STD 508A CAN/CSA C22.2 NO. 14
Ambient operating temperature	-13°F to 122°F (-25°C to 50°C)	
Dimensions	24" W X 24" H X 6.75" D (610 mm W X 610 mm H X 171 mm D)	
Enclosure rating	NEMA 4/12 (Indoor/outdoor locations)	
Control supply voltage	90 - 280 V dropped to 12 V with switching power supply	
Weight	70 lbs (31.75 kg)	
Humidity	0 – 90% non-condensing	
Fuse	Bussman MDL	
Heating Cable Circuit Contactors		
Rating	3-pole – 30 A/pole 277 Vac	
Type	Sprecher-Schuh CA7-16-10-12D	
Quantity	5	
Temperature Sensors		
Type	100-ohm platinum RTD, 3-wire, = 0.00385 ohm/ohm/°C Can be extended with a 3-conductor shielded cable of 20 ohm maximum per conductor	
Quantity	Up to five wired directly to the ACCS-CRM	
Communication to ACCS-UIT2		
Type	2 wire RS-485	
Cable	One shielded twisted pair	
Length	4000 ft (1200 M) maximum	
Quantity	Up to 52 ACCS-PCM2-5 panels may be connected to one ACCS-UIT2	
Line Current Sensors		
Max current	60 A	
Accuracy	± 2% of reading	
Ground-Fault Sensors		
Range	10 – 200 mA	
Accuracy	± 2% of reading	

ACCS-PCM2-5 Power Control Panel (Continued)

Connection Terminals

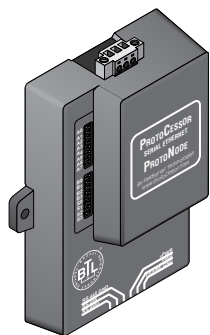
Power Supply/Line/Load	#22 – 8 AWG
RS-485	#24 – 12 AWG
RTD	#24 – 12 AWG

Remote Monitoring Module (Optional)



A Remote Monitoring Module (RMM2) is used to collect additional temperatures for control and monitoring of the heat-tracing circuit by the DigiTrace ACCS-PCM2-5 control panel, through the ACCS-UIT2 user interface terminal. The RMM2 accepts up to eight RTDs that measure pipe, vessel, or ambient temperatures. Multiple RMM2s communicate with a single ACCS-UIT2 to provide centralized monitoring of temperatures. A single twisted-pair RS-485 cable connects up to 16 RMM2s for a total monitoring capability of 128 temperatures. The RMM2s are placed near desired measurement locations. The RMM2 is available for DIN rail mount or pre-installed inside a polycarbonate NEMA-4X enclosure.

Protocol Gateway (Optional)

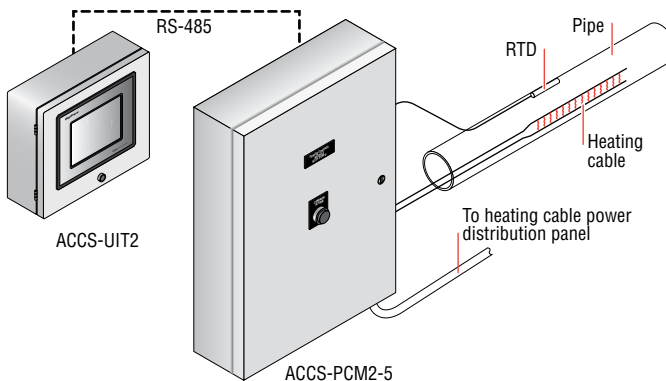


The DigiTrace ProtoNode is an external, high performance multi-protocol gateway for customers needing protocol translation between Building Management Systems (BMS) and the DigiTrace ACCS-30 controller.

The ProtoNode-LER is for LonWorks® systems; and the ProtoNode-RER is for BACnet® or Metasys® N2 systems.

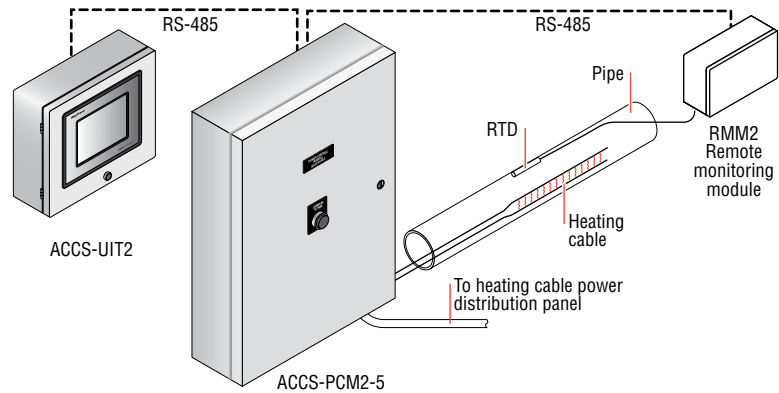
Typical Configurations for the DigiTrace ACCS-30 System

- Monitors ground-fault current and alarms/ trip control contactor upon fault
- Monitors heater current and alarms upon low or high current conditions
- Monitors pipe temperature (via RTD inputs wired back to the DigiTrace ACCS-PCM2-5 or RMM2)

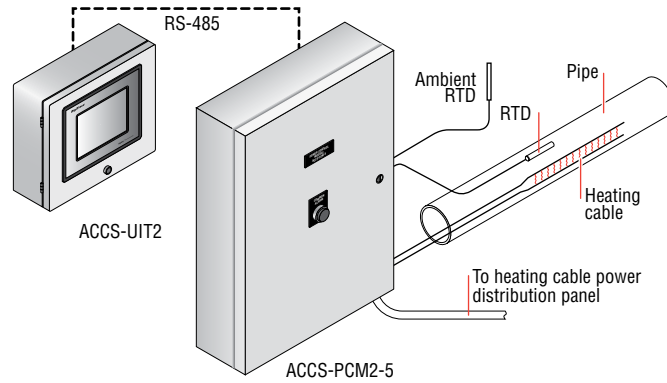


Typical Configurations for the DigiTrace ACCS-30 System (Continued)

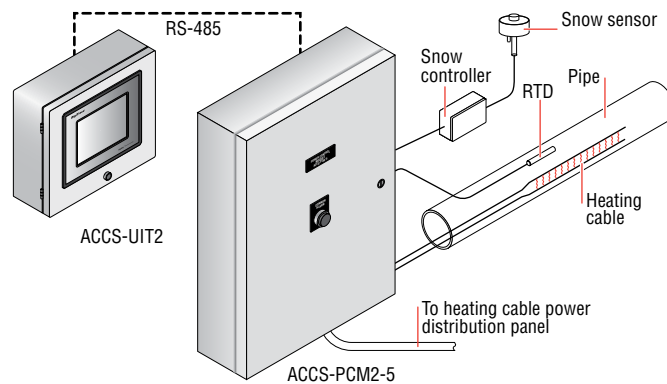
- Monitors ground-fault current and alarms/ trip control contactor upon fault
- Monitors heater current and alarms upon low or high current conditions
- Monitors pipe temperature (via RTD inputs wired back to the DigiTrace ACCS-PCM2-5)
- Using optional RMM2 (remote monitoring modules) mounted in the field, up to 128 RTD inputs can be added to the ACCS-30 system
- The RMMs allow the RTD cables to be terminated locally and only a single RS-485 twisted wire pair brought back to the panel. This results in a significant reduction in field wiring.



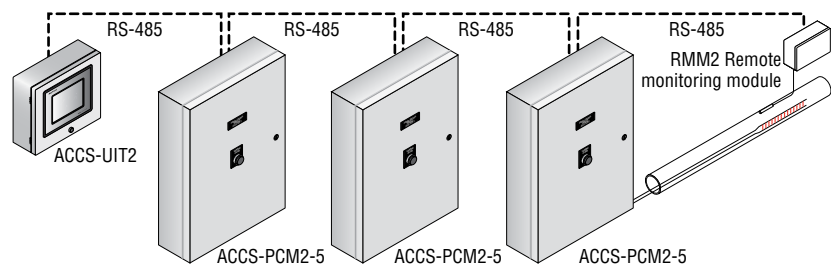
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- Monitors heater current and alarms upon low or high current conditions
- Monitors pipe temperature (via RTD inputs wired back to the DigiTrace ACCS-PCM2-5 or RMM2)
- Connects to snow controllers (via RTD input) to power circuits when snow/ice melting is required



- Multiple panels can be ganged together for control using a single DigiTrace User Interface Terminal
- Communications is accomplished using RS-485 protocol
- Up to 260 heat trace circuits can be supported using this architecture



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