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APPROVAL REPORT

**CHEETAH Xi FIRE ALARM CONTROL SYSTEM FOR
LOCAL PROTECTIVE SIGNALING, AUXILIARY,
CENTRAL STATION AND REMOTE STATION
SIGNALING, AUTOMATIC RELEASES FOR
EXTINGUISHING SYSTEMS, AND PREACTION &
DELUGE SPRINKLER SYSTEMS**

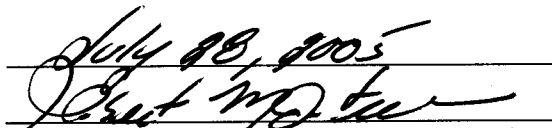
Prepared for:
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704 South 10th Street
Blue Springs, MO 64013

Project ID: 3023436

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Authorized by:

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**CHEETAH Xi FIRE ALARM CONTROL SYSTEM
FOR LOCAL PROTECTIVE SIGNALING, AUXILIARY,
CENTRAL STATION AND REMOTE STATION SIGNALING,
AUTOMATIC EXTINGUISHING SYSTEMS,
AND PREACTION & DELUGE SPRINKLER SYSTEMS**

From

**Fike Corporation
704 South 10th Street
Blue Springs, MO 64013**

I INTRODUCTION

- 1.1 Fike Corporation requested an examination of their modular Cheetah Xi controller with V1.30 firmware for Local Protective Signaling, Auxiliary, Central Station Signaling, Remote Station Signaling, Automatic Extinguishing Systems, and Preaction and Deluge Sprinkler Systems.
- 1.2 In addition, Fike requested an examination of a network card p/n 10-2482 to allow for networking of up to 128 of any combination Cheetah Xi controllers and previously Approved CyberCat 254 & 1016 fire alarm control systems (Reference Approval Report 3020297). An upgrade to the firmware of the CyberCat controllers was made to accommodate for the new network card connection.
- 1.3 The equipment listed below identifies the Fike modules and other equipment which make up the accessories and optional modules list for the Cheetah Xi controller. This table also identifies any applicable firmware and operating software revisions which are part of this project:

<u>Model</u>	<u>Description</u>	<u>Firmware</u>
10-2525	CyberCat 254 Controller	1.30
10-2472	CyberCat 1016 Controller	1.30
10-2542	Cheetah Xi Controller	1.30
10-2482	Network Card	1.00
10-2473	SLC Supplemental Loop Module	
10-2474-p	Supplemental Power Supply; p: (1=120V, 2=240V)	N/A
55-052	Solenoid Release Control Module	N/A
* 10-1832	Agent Release Module (ARM III)	N/A
* 55-042	Supervised Control Module (SCM)	N/A
* 10-2204	RM4; Relay Module	N/A
* 10-2254	RPM – Reverse Polarity Module	N/A
* 10-2411	256 LED Graphic Controller	1.10
* 10-2276	Remote Display with Backbox	3.10
10-2483-c	CyberCat Enclosure; c: (R=Red, B=Black)	N/A
10-2541-c	Cheetah Xi Enclosure; c(R=Red, G=Grey)	N/A

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- * 02-10881 Transformer; 120 V ac N/A
- * 02-10882 Transformer, 240 V ac N/A

* Note: These Fike modules were previously Approved in Reports 3020297, 3014450, 0B4A7.AY.

- 1.4 The following (Class B) Style 4 addressable devices are manufactured by System Sensor and have already been private labeled with Fike Corporation in FM Approval Report 3021590. These addressable devices have been examined (Reference Approval Report 3020471) and are compatible with the Cheetah Xi, CyberCat 254 & 1016 fire alarm controls:

<u>Description</u>	<u>System Sensor P/N</u>	<u>Fike Corp P/N</u>
Photoelectric Smoke Sensor	ED-P	63-1052
Photo/135F Heat Combination Sensor	ED-PT	63-1053
135-190F Fixed Temp and Rate of Rise Heat Detector	ED-T	63-1039
Ionization Smoke Sensor	ED-I	67-033
6" Sensor Base	EBF	63-1054
4" Sensor Base	EB	63-1055
6" Relay Base	EBR	63-1063
6" Sounder Base	EBS	63-1064
Mini Monitor Module	EM-1MM	55-045
4" Monitor Module	EM-1SM	55-041
Pull Station Monitor Module	EP-D2	20-1063
NAC Supervise Control Module	EM-1SR	55-042
Relay Module	EM-1R	55-043
Photo Duct Sensor Head	ED-DP	63-1057
Duct Detector Housing	ED-DPR	63-1056
* Solenoid Release Module	EM-1RM	55-052

* Note: The Solenoid Release Module is only compatible with the Cheetah Xi control system.

- 1.5 The following (Class A) Style 7 addressable devices are manufactured by System Sensor and will be private labeled with Fike Corporation. These addressable devices have been examined (Reference Approval Report 3020471) and are compatible with the Cheetah Xi, CyberCat 254 & 1016 fire alarm controls:

<u>Description</u>	<u>System Sensor P/N</u>	<u>Fike Corp P/N</u>
Photoelectric Smoke Sensor	ED-PI	63-1058
Photo/135F Heat Combination Sensor	ED-PTI	63-1059
135-190F Fixed Temp and Rate of Rise Heat Detector	ED-TI	63-1040
Ionization Smoke Sensor	EDI	67-034
6" Sensor Base	EBFI	63-1060
4" Sensor Base	EBI	63-1061
Mini Monitor Module	EM-1MMI	55-050
4" Monitor Module	EM-1MI	55-046
Pull Station Monitor Module	EP-2DI	20-1064
NAC Supervise Control Module	EM-1SRI	55-047
Relay Module	EM-1RI	55-048
Photo Duct Sensor Head	ED-DPI	63-1062
Solenoid Release Module	EM-1RMI	55-053

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* Note: The Solenoid Release Module is only compatible with the Cheetah Xi control system.

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1.7 **Standards**

Title	Class Number	Date
National Fire Alarm Code	ANSI/NFPA 72	2002
Deluge & Preaction Sprinkler Systems	FM Standard 1011	November, 1973

1.8 **Listing:** The Cheetah Xi controller and accessories will be shown as follows in the *Approval Guide*, a publication of FM Approvals. In addition, modifications to the listings of the CyberCat 254 & 1016 fire alarm control systems are **bold and underlined**. The modified listings will also be shown as follows in the *Approval Guide*, a publication of FM Approvals:

LOCAL PROTECTIVE SIGNALING

CyberCat 254 & 1016 Fire Alarm Control Systems (P/N 10-064 & 10-066). Programmable addressable systems consisting of P/N 10-2525 and P/N 10-2472 CyberCat Controllers with **V1.3** firmware for the 254 and 1016 models, respectively, within P/N 10-2483(R/B) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). Signaling line circuit RS485 meets (Class B) Style 3.5 when connected to Remote Display P/N 10-2276 (firmware P/N 10-2278 Rev. 3.10). The CyberCat 1016 with 10-2472 controller board provides two signaling line circuit (SLC) which meet NFPA Style 4, 6, or 7 wiring performance. A Supplemental Loop Module P/N 10-2473 adds two more SLC loops. Up to 254 addressable analog devices maybe connected to each SLC for a total of 1016 devices. The CyberCat 254 with P/N 10-2525 controller board provides a single signaling line circuit (SLC) which meets NFPA Style 4, 6, or 7 wiring performance. Up to 254 addressable analog devices maybe connected to the single SLC loop. The following addressable devices are compatible with the CyberCat fire alarm control: Photoelectric Smoke Sensor p/ns 63-1052 **or 63-1058** ; Photo/135F Heat Combination Sensor p/ns 63-1053 **or 63-1059**; 135-190°F Fixed Temp and Rate of Rise Heat Sensor p/ns 63-1039 **or 60-1040** (detector spacing not to exceed 30 x 30 ft); **Ionization Smoke Sensor p/ns 67-033 or 67-034** for use with 6" Sensor Bases p/ns 63-1054 **or 63-1060** , 4" Sensor Bases p/ns 63-1055 **or 63-1061**, 6" **Sounder Base p/n 63-1064 or 6" Relay Base p/n 63-1063**; Mini Monitor Modules p/ns 55-045 **or 55-050**; Monitor Modules p/ns 55-041 **or 55-046**; Pull Station p/n 20-1063 **or 20-1064**; NAC Supervise Control Modules p/n 55-042 **or 55-047**; Relay Module p/n 55-043 **or 55-048**; Photo Duct Sensor Heads p/n 63-1057 **or 63-1062**; and Duct Detector Housing p/n 63-1056. Two notification appliance circuits (Class A or B) Style Y, or Z are provided. Each NAC is rated for 2.0 Amps output. **RS232 circuit located on the controller communicates with the HLI/VESDA Interface Module Assembly P/N 10-2277 connected to a VESDA Laser PLUS Detector (Software Version 2.09.00), VESDA Laser Compact Smoke Detector (Software Version 3.01.00) and/or VESDA Laser Scanner (Software Version 2.14.03).** Optional modules for use with the CyberCat include p/n 10-2204 RM4 Relay Module which provides 4 SPDT programmable relays rated 30 V dc @ 2A or 110 V ac @ 0.5A. The power supply provides a 6 amp, 24 V dc output to the control. This can be expanded to a 12 amp, 24 V dc output when p/n 10-2474-p Supplemental Power Supply is connected. 24 V dc batteries rated 18-75 AH are available to provide 24 (or 60 for auxiliary signaling) hours of emergency **operation** (See also CENTRAL STATION, REMOTE STATION, and AUTOMATIC RELEASES FOR PREACTION AND DELUGE SPRINKLER SYSTEMS.)

Cheetah Xi Fire Alarm Control Systems (P/N 10-068). Programmable addressable systems consisting of P/N 10-2542 Cheetah Xi Controller with V1.3, within P/N 10-2541(R/G) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). Signaling line circuit RS485 meets (Class B) Style 3.5 when connected to Remote Display P/N 10-2276 (firmware P/N 10-2278 Rev. 3.10). The Cheetah Xi with 10-2542 controller board provides two signaling line circuit (SLC) which meet NFPA Style 4, 6, or 7 wiring performance. A Supplemental Loop Module P/N 10-2473 adds two more SLC loops. Up to 254 addressable analog devices maybe connected to each SLC for a total of 1016 devices. The following addressable devices are compatible with the CyberCat fire alarm control: Photoelectric Smoke Sensor p/ns 63-1052 or 63-1058 ; Photo/135F Heat Combination Sensor p/ns 63-1053 or 63-1059; 135-190°F Fixed Temp and Rate of Rise Heat Sensor p/ns 63-1039 or 60-1040 (detector spacing not to exceed 30 x 30 ft); Ionization Smoke Sensor p/ns 67-033 or 67-034 for use with 6" Sensor Bases p/ns 63-1054 or 63-1060 , 4" Sensor Bases p/ns 63-1055 or 63-1061, 6" Sounder Base p/n 63-1064 or 6" Relay Base p/n 63-1063; Mini Monitor Modules p/ns 55-045 or 55-050; Monitor Modules p/ns 55-041 or 55-046; Pull Station p/n 20-1063 or 20-1064; NAC Supervise Control Modules p/n 55-042 or 55-047; Relay Module p/n 55-043 or 55-048; Releasing Control Module 55-043 or 55-048; Photo Duct Sensor Heads p/n 63-1057 or 63-1062; and Duct Detector Housing p/n 63-1056. Two notification appliance circuits (Class A or B) Style Y, or Z are provided. Each NAC is rated for 2.0 Amps output. RS232 circuit located on the controller communicates with the HLI/VESDA Interface Module Assembly P/N 10-2277 connected to a VESDA Laser PLUS Detector (Software Version 2.09.00), VESDA Laser Compact Smoke Detector (Software Version 3.01.00) and/or VESDA Laser Scanner (Software Version 2.14.03). Optional modules for use with the Cheetah Xi include p/n 10-2204 RM4 Relay Module which provides 4 SPDT programmable relays rated 30 V dc @ 2A or 110 V ac @ 0.5A. The power supply provides a 6 amp, 24 V dc output to the control. This can be expanded to a 12 amp, 24 V dc output when p/n 10-2474-p Supplemental Power Supply is connected. 24 V dc batteries rated 18-75 AH are available to provide 24 (or 60 for auxiliary signaling) hours of emergency operation (See also CENTRAL STATION, REMOTE STATION, and AUTOMATIC RELEASES FOR PREACTION AND DELUGE SPRINKLER SYSTEMS.)

AUTOMATIC RELEASES FOR EXTINGUISHING SYSTEMS AND OTHER FIRE PROTECTION EQUIPMENT

Cheetah Xi Programmable Fire Alarm Control P/N 10-068 with V1.30 firmware connected to a Release Control Module **p/ns 55-043 or 55-048** to allow for release of extinguishing agents. Agent Release Module (ARM III) P/N 10-1832 is connected to the **Release Control Module** to release the agents . Up to 6 ARMs, **or 2 12V solenoids, or 1 24V solenoid can be supported by the Release Module.**

CENTRAL STATION SIGNALING

CyberCat 254 & 1016 Fire Alarm Control Systems (P/N 10-064 & 10-066). **Programmable addressable systems consisting of P/N 10-2525 and P/N 10-2472 CyberCat Controllers with V1.30 firmware for the 254 and 1016 models, respectively, within P/N 10-2483(R/B) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). Digital alarm Communicator Transmitter DACT p/n 10-2528 (Bosch Security Systems, Inc. Model D9068) mounted within the control's enclosure at the protected premises communicating via a signaling channel, established through the public switched telephone network, with two or more Bosch Security Systems, Inc. Model D6500, D6600 or Ademco 685 Digital Alarm Communicator Receivers (DACRs). DS9068 must be set for 24 hour test signal. DACT**

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Programmer P/N10-2477 is needed for configuring the 10-2528 DACT. DS9068 must be configured for a delayed AC power loss signal to transmit to the DACR after six hours. 24 V dc batteries rated 18-75 AH are available to provide 24 hours of emergency. (See also LOCAL PROTECTIVE SIGNALING for details on the control).

Cheetah Xi Fire Alarm Control System (P/N 10-068). Programmable addressable system consisting of P/N 10-2542 Cheetah Xi Controller with V1.30, within P/N 10-2541(R/G) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). Digital alarm Communicator Transmitter DACT p/n 10-2528 (Bosch Security Systems, Inc. Model D9068) mounted within the control's enclosure at the protected premises communicating via a signaling channel, established through the public switched telephone network, with two or more Bosch Security Systems, Inc. Model D6500, D6600 or Ademco 685 Digital Alarm Communicator Receivers (DACRs). DS9068 must be set for 24 hour test signal. DACT Programmer P/N10-2477 is needed for configuring the 10-2528 DACT. DS9068 must be configured for a delayed AC power loss signal to transmit to the DACR after six hours. 24 V dc batteries rated 18-75 AH are available to provide 24 hours of emergency. (See also LOCAL PROTECTIVE SIGNALING for details on the control).

REMOTE STATION SIGNALING

CyberCat 254 & 1016 Fire Alarm Control Systems (P/N 10-064 & 10-066). Programmable addressable systems consisting of P/N 10-2525 and P/N 10-2472 CyberCat Controllers with **V1.30** firmware for the 254 and 1016 models, respectively, within P/N 10-2483(R/B) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). The control is equipped with integral digital alarm control transmitters (DACT) p/n 10-2476 (Bosch Security Systems, Inc. Model D9068) reporting to any two or more of the following models: Bosch Security Systems, Inc. Model D6500, D6600 or Ademco 685 Digital Alarm Communicator Receivers (DACRs) located at an a constantly attended location such as a public fire station. The connection between the controls and receivers shall be via a signaling channel established through the public switched telephone network. Alternatively, for auxiliary signaling and remote station signaling, p/n 10-2254 RPM Reverse Polarity Module provides reverse polarity type service. In addition, p/n 10-2413 city tie interface provides the ability to operate a local energy master-box. 24 V dc batteries rated 18-75 AH are available to provide 60 hours of emergency operation. It is essential that there be complete cooperation between the protected property and the remote station personnel; otherwise, substandard service may result regardless of equipment performance. See LOCAL PROTECTIVE SIGNALING for Detailed description of the controls and their accessories.

Cheetah Xi Fire Alarm Control System (P/N 10-068). Programmable addressable system consisting of P/N 10-2542 Cheetah Xi Controllers with **V1.30** firmware, within P/N 10-2541(R/G) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). The control is equipped with integral digital alarm control transmitters (DACT) p/n 10-2476 (Bosch Security Systems, Inc. Model D9068) reporting to any two or more of the following models: Bosch Security Systems, Inc. Model D6500, D6600 or Ademco 685 Digital Alarm Communicator Receivers (DACRs) located at an a constantly attended location such as a public fire station. The connection between the controls and receivers shall be via a signaling channel established through the public switched telephone network. Alternatively, for auxiliary signaling and remote station signaling, p/n 10-2254 RPM Reverse Polarity Module provides reverse polarity type service. In addition, p/n 10-2413 city tie interface provides the ability to operate a local energy master-box. 24 V dc batteries rated 18-75 AH are available to provide 60 hours of emergency operation. It is essential that there be complete cooperation between the protected property and the remote station personnel; otherwise, substandard service may result

regardless of equipment performance. See LOCAL PROTECTIVE SIGNALING for Detailed description of the controls and their accessories.

PREACTION AND DELUGE SPRINKLER SYSTEM

CyberCat 254 & 1016 Fire Alarm Control Systems (P/N 10-064 & 10-066). Programmable addressable systems consisting of P/N 10-2525 and P/N 10-2472 CyberCat Controllers with V1.30 firmware for the 254 and 1016 models, respectively, within P/N 10-2483(R/B) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). Controller connects with p/ns 55-042 or 55-047 Supervised Control Module (SCM) to provide peer-to-peer digital communication protocol between the conventional notification appliance circuits and the CyberCat signaling line circuit. In addition, the SCM operates solenoids rated up to 2 Amps @24V dc. [See further description under LOCAL PROTECTIVE SIGNALING].

Cheetah Xi Fire Alarm Control System (P/N 10-068). Programmable addressable system consisting of P/N 10-2542 Cheetah Xi Controller with V1.30, within P/N 10-2541(R/G) enclosure, and power supply with transformers P/N 02-10881 (120 Vac) or P/N 02-10882 (240 Vac). Controller connects with p/ns 55-042 or 55-047 Supervised Control Module (SCM) to provide peer-to-peer digital communication protocol between the conventional notification appliance circuits and the CyberCat signaling line circuit. In addition, the SCM operates solenoids rated up to 2 Amps @ 24V dc. In addition, Release Control Module p/ns 55-042 or 55-047 operates solenoids rated up to 2 Amps @24 V dc. For Approved combinations of solenoid and water control valves, refer to the Automatic Water Control Valve listings that follow. 24 V dc batteries rated 18-75 AH are available to provide 90 hours of emergency operation. [See further description under LOCAL PROTECTIVE SIGNALING].

WATER CONTROL VALVES

Control Panel Group [2]. These panels are compatible with Solenoid Groups [A], [B], [D], [E], and [G]:

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CyberCat 1016 Fire Alarm Control System. P/N 10-2472 Controller with 1.30firmware.

CyberCat 254 Fire Alarm Control System. P/N 10-2525 Controller with 1.30firmware.

Cheetah Xi Fire Alarm Control System. P/N 10-2542 Controller with 1.30 firmware

Control Panel Group [4]. This panel is compatible with Solenoid Group [F].

Fike Corporation, 704 S. 10th Street, Blue Springs, MO 64015

CyberCat 1016 Fire Alarm Control System. P/N 10-2472 Controller with 1.30firmware.

CyberCat 254 Fire Alarm Control System. P/N 10-2525 Controller with 1.30firmware.

Cheetah Xi Fire Alarm Control System. P/N 10-2542 Controller with 1.30 firmware

II DESCRIPTION

- 2.1 The following paragraphs give a brief description of the equipment covered by this report. A more detailed description of the equipment can be found in the manufacturer's Installation, Operation and Maintenance Manual. The manufacturer has made available all necessary circuit

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schematics and operating specifications, which have been examined and are retained on file at FM Approvals.

- 2.2 Programmable Cheetah Xi Fire Alarm Control is an addressable system consisting of p/n 10-2542 Cheetah Xi Controllers with 1.30 firmware. The CyberCat 1016 and Cheetah Xi controller board provides two signaling line circuit (SLC) which meet NFPA Style 4, 6, or 7 wiring performance. A Supplemental Loop Module P/N 10-2473 adds two more SLC loops. Up to 254 addressable analog devices maybe connected to each SLC for a total of 1016 devices. The CyberCat 254 controller board provides one signaling line circuit (SLC) which meet NFPA Style 4, 6, or 7 wiring performance. Only 254 addressable analog devices maybe connected to this SLC .
- 2.3 Two notification appliance circuits (Class A or B) Style Y, or Z are provided for the Cheetah Xi Fire Alarm Control System. Each NAC is rated for 2.0 Amps output.
- 2.4 Optional module for use with the Cheetah Xi includes p/n 10-2204 RM4 Relay Module which provides 4 SPDT programmable relays rated 30 V dc @ 2A or 110 V ac @ 0.5A.
- 2.5 Signaling line circuit RS485 on the controller board meets (Class B) Style 3.5 when connected to Remote Display P/N 10-2276 (firmware P/N 10-2278 Rev. 3.10).
- 2.6 The main power supply on the Cheetah Xi is identical in design and configuration to the previously Approved CyberCat controllers. The power supply circuit provides a 6 amp, 24 V dc output to the control. This can be expanded to a 12 amp, 24 V dc output when p/n 10-2474-p Supplemental Power Supply is connected. 24 V dc batteries rated 7-75 AH are available to provide 24 (or 60 for auxiliary signaling) hours of emergency.
- 2.7 Digital alarm Communicator Transmitter DACT p/n 10-2528 (Bosch Security Systems, Inc. Model D9068) mounts within the control's enclosure to provide the Cheetah Xi the ability to communicate via a signaling channel, established through the public switched telephone network, with two or more Bosch Security Systems, Inc. Model D6500, D6600 or Ademco 685 Digital Alarm Communicator Receivers (DACRs).
- 2.8 The Cheetah Xi control connects with previously Approved p/n 55-042 Supervised Control Module (SCM) to provide peer-to-peer digital communication protocol between the conventional notification appliance circuits and the CyberCat signaling line circuit. In addition, the SCM operates solenoids rated up to 2 Amps @24V dc.
- 2.9 Network Card p/n 10-2482 mounts on the controller of the Cheetah Xi and both the CyberCat controllers to enable communication between the connected controllers. Up to 128 controllers of any combination can communicate with one another when the network card is connected. The network card can be wired in a Class B, Style 4 or Class A, Style 6 configuration.
- 2.10 An RS232 circuit located on the Cheetah Xi and CyberCat controllers communicates with the HLI/VESDA Interface Module Assembly P/N 10-2277 connected to an Approved VESDA Laser PLUS Detector (Software Version 2.09.00), VESDA Laser Compact Smoke Detector (Software Version 3.01.00) and/or VESDA Laser Scanner (Software Version 2.14.03).
- 2.11 Direct supervision of the Auxiliary power outputs has been added to the CyberCat and Cheetah Xi control panels with firmware REV level 1.30 eliminating the need for end of line relays to supervise the 24V delivered to the Supervised Control Module and Releasing Control Module.

III EXAMINATION

3.1 Several sample fire alarm controls each made up of the basic following modules: p/n 10-2542 Cheetah Xi Controller with firmware REV level 1.30 and p/n10-2473 SLC Supplemental Loop Module, p/n 10-2474-p Supplemental Power Supply p: (1=120V, 2=240V), p/n 55-042 Style 4 Supervised Control Module (SCM), p/n 10-2204 RM4 Relay Module, p/n 10-2254 RPM Reverse Polarity Module, p/n 10-2276 Remote Display with Backbox at REV level 3.10 within 10-2541-R enclosure. Both p/n 02-10881 Transformer rated 120 V ac and p/n 02-10882 transformer rated 240 V ac were used in different samples. Various combinations of devices and programmable configurations were set-up for examination and testing. All of the System Sensor analog/addressable devices as described in Section 1.3 were connected to the sample Cheetah Xi controls set up for testing. Many tests were conducted at Fike Corporation's facilities in Blue Springs, MO; while other tests were completed at FM Approvals' facilities in Norwood, MA. The samples were considered to be representative of the product line and were examined, tested, and compared to the manufacturer's drawings. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.

RS232 circuit located on the controller communicates with the HLI/VESDA Interface Module Assembly P/N 10-2277 connected to a VESDA Laser PLUS Detector (Software Version 2.09.00), VESDA Laser Compact Smoke Detector (Software Version 3.01.00) and/or VESDA Laser Scanner (Software Version 2.14.03).

3.2 **Normal Operation** – Performance and functionality tests were completed as follows:

3.2.1 **Trouble Signals** - Fault conditions (single open, single ground, and wire to wire shorts) were simulated on external circuits. The TROUBLE LED (yellow), and a pulsing local buzzer annunciated this change of condition. In addition, the LCD detailed the condition including the time and location of the trouble. The acknowledge key must be pressed to silence the local buzzer and steady the flashing LED. The LED did not reset until the fault was corrected as is required. It was verified that a silenced audible trouble signal re-sounded automatically 24 hours later as is required.

3.2.2 **Alarm Signals** - Alarm conditions were simulated on the signaling line circuits. The alarm signals were annunciated by activation of the ALARM LED. In addition, the LCD detailed the condition including the time and location of the alarm. The acknowledge key must be pressed to silence the local buzzer and steady the flashing LED. The alarm LED did not reset until the alarm was cleared as is required. Additionally, the notification appliances activated under 10 seconds as is required.

3.2.3 **Supervisory Signals** – Abnormal conditions such as shutdown to sprinkler control valves were simulated on external circuits designated for supervisory devices. The SUPERVISORY LED (yellow) and a pulsing local buzzer annunciated this change of condition. In addition, the LCD detailed the condition including the time and location of the off-normal condition. This is satisfactory. The acknowledge key must be pressed to silence the local buzzer and steady the flashing LED. The LED did not reset until the fault was corrected as is required.

3.3 **Special System Features**

3.3.1 **Positive Alarm Sequence** – When permitted by the authority having jurisdiction, the Cheetah Xi operating software allows the user to configure selected smoke sensors for positive alarm sequence operation:

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- It was verified that when the selected sensors were configured for this operation, the user had up to 15 seconds to acknowledge an alarm at the control. When the acknowledge button was pushed, the user has 180 seconds to investigate the alarm condition and reset the system. If the system is not reset within the allocated 180 seconds, the notification appliance circuits activated.
- It was verified that when a second automatic fire detector selected for positive alarm sequence actuated during the investigation period, notification signals activated.
- It was verified that when any other initiating devices activated during the investigation period, notification signals activated.
- It was verified that the Cheetah Xi provides means to bypass the positive alarm sequence.

3.3.2 **Alarm Verification:** The control was programmed with the alarm verification feature on certain sensors. The following results were noted:

- It was verified that the alarm from the subject smoke detector, which had been continuously subjected to a smoke concentration above the set alarm threshold, did not delay the activation of the notification appliances for more than one minute.
- It was verified that actuation of an alarm-initiating device other than a smoke detector caused the actuation of the notification appliances.

3.3.3 **Summing** – Although this feature is not recognized by NFPA 72, claims by the manufacturer on its operation were verified. According to the manufacturer, a ‘master’ detector is configured as the ‘head’ detector within a zone. Up to 8 other detectors are considered ‘summing’ detectors for the ‘head’ detector. The user sets a ‘summing’ smoke obscuration level at the control for the ‘head’ detector. Primarily, it was verified that when any one of the ‘summing’ detectors or ‘head’ detector sense a smoke obscuration level greater than its factor set default range, the detector will go into alarm as is required. It was also verified that when any one or more ‘summing’ detectors sense a smoke obscuration not high enough to warrant an alarm but greater than its standby level, then the ‘head’ detector will add up all the readings on the ‘summing’ detectors and compare that with the pre-set ‘summing’ smoke obscuration level previously set at the control. If the ‘summing’ obscuration level exceeds the pre-set ‘summing’ level, the control will annunciate a type 2 alarm at the control LCD. This level will activate the local alarm sounder and pre-programmed notification appliances. No releasing application will result from a type 2 alarm.

3.4 **Line Supervision Tests** – This test was conducted to verify that a ground fault or an open on the releasing circuit resulted in a trouble signal. It was verified that a single ground fault did not affect releasing operation.

3.5 **Voltage Variation Tests** - The input power to the control connected to a p/n 02-10881 transformer rated 120 V ac was varied from 85% to 110% of the rated primary supply voltage (102 to 132 V ac In addition, both controls’ secondary supply voltage was varied from 85% to maximum battery float voltage (20.4 to 27.3 V dc).

3.5.1 All the equipment operated properly and without false signal or malfunction over the entire range of voltage variation. This is satisfactory.

3.5.2 With the panel fully loaded and with the input power at 20.4 V dc, the release circuits operated normally when an alarm condition was simulated as is required.

3.5.3 With the input power to the panel varied from 85% to 110% both ac and dc, the notification appliance circuit output voltage varied from 19 to 25.47 V dc. Only FM Approved notification

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appliances capable of operating over this entire voltage range are compatible with the CyberCat or Cheetah Xi controllers.

- 3.6 **Circuit Performance** - The signaling line circuits, the release circuits, and the notification appliance circuits were tested to verify that they met the appropriate performance requirements as described in ANSI/NFPA 72. Open, ground, wire to wire short, combination open and ground faults were introduced through the appropriate circuit.
- 3.6.1 **Notification Appliance Circuits** - It was verified that the two notification appliance circuits on the motherboard of the Cheetah Xi meet (Class A or B) Style Y, or Z wiring performance as described in table 6.7 of NFPA 72.
- 3.6.2 **Signaling Line Circuit** - It was verified that the RS 485 signaling line circuits between the networked Cheetah Xi and CyberCat controllers meet (Class A or B) Style 4 or 6 wiring performance as described in table 6.6.1 of NFPA 72.
- 3.7 **Secondary Power Supply Tests** - The secondary (standby) power supply is identical in design and operation to the previously Approved power supply used with the CyberCat controllers; therefore, testing of the power supply as described below is redundant and was limited in places. It is required that the power supply shall automatically supply energy to the system within 10 seconds whenever the primary power supply is incapable of providing the minimum voltage required for proper operation.
- 3.7.1 Transfer to the secondary power supply was accomplished automatically and in less than 10 seconds upon loss of primary power to the control as is required.
- 3.7.2 The equipment operated properly before and after transfer to secondary power.
- 3.7.3 It was verified that secondary power is supervised.
- 3.8 **Preaction/Deluge Releasing Circuit Test** - The control was tested for compatibility with the solenoid valves identified in the Listing Section 1.7 under Water Control Valves. The input voltage to the control was varied over its operating range of 102 to 132 V ac primary and 20.4 to 27.4 V dc secondary. It was not necessary to test the control over the operating voltage of 204 to 264 because the power is regulated.
- 3.8.1 Testing confirmed that with the specified maximum solenoid release circuit wiring resistance, the voltage at the releasing device remained above 20.4 V dc, as is required.
- 3.8.2 Testing confirmed that the solenoid release circuit wiring is supervised for open circuit and ground faults, as is required.
- 3.9 **Environmental Tests** - A control unit as described in 3.1 was conditioned for at least 4 hours each at 120°F (49°C) and 32°F (0°C), and for 24 hours at 100°F (38°C) with 90% relative humidity. There was no adverse effect on operation as a result of these exposures.
- 3.10 **Electrical Utilization Equipment Tests**
- 3.10.1 **Electrical Shock** - Examination showed that accessibility to the 120/240 Vac energized circuits of the Cheetah Xi was suitably restricted by a locked enclosure as is required.

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- 3.10.2 **Protective Grounding** - Accessible conductive parts of the equipment that are likely to become energized in the event of a fault shall be properly grounded. Accessible metal parts of the Cheetah Xi control are bonded to enable proper ground connections during installation. The maximum resistance measured between the ground terminal and any accessible part was measured to be less than 1 ohm.
- 3.10.3 **Battery Circuit Reverse Polarization** – This test was deemed unnecessary because the power supply circuit for the Cheetah Xi is identical to the previously Approved CyberCat controllers.
- 3.10.4 **Equipment Nameplate Rating Test** – This test was deemed unnecessary because the power supply circuit for the Cheetah Xi is identical to the previously Approved CyberCat controllers.
- 3.10.5 **Transformer Fault Test** – This test was deemed unnecessary because the transformers used for the Cheetah Xi are identical to the previously Approved CyberCat controllers.
- 3.11 **Dielectric Tests** – This test was deemed unnecessary because the circuitry on the controller, relay modules and other modules for the Cheetah Xi is identical to the previously Approved CyberCat controllers.
- 3.12 **Vibration** - The powered Model Cheetah Xi was subjected to a vibration test. The equipment was mounted in its normal positions and subjected to a vertical vibration with total displacement of 0.02 in. (0.5 mm) at a frequency sweep of 10-30 Hz for a period of four hours. There was no false alarm, and no loosening of parts or permanent deformation as a result of this test.
- 3.13 **Battery Charge and Discharge Test** - This test was deemed unnecessary because the power supply circuit for the Cheetah Xi is identical to the previously Approved CyberCat controllers.
- 3.14 **Surge Transient Test** - Protection against surge line transients was considered. For this test, representative signaling line circuits, notification appliance circuits and releasing circuits were subjected to 60 pulses consisting of five different transient waveforms having peak voltage levels of 100, 500, 1000, 1500, and 2400 volts. It was verified that the control showed no instability before, during and after this test.
- 3.14.1 It was also verified that the power supply was able to withstand surge line transients of 6kV superimposed on the main line input.
- 3.14.2 Protection against internally induced transients was also verified. The power to the Cheetah Xi control was interrupted five hundred times while monitoring the releasing circuits for instability. The test results showed that the equipment did not false alarm, operated as intended, and retained its required stored memory.
- 3.15 **Radio Frequency Interference** - the following tests were run: A Cheetah Xi control with a sample of each of the devices covered by this report connected was subjected to frequencies of 155 and 450 MHZ with equivalent radiation power levels of approximately 5.0 Watts at a distance of 24 in. (0.6 m) from the control. The system did not false alarm or give any indication of instability as a result of these exposures.
- 3.16 **Smoke and Heat Detector Tests** – Reference Approval Report 3020471 for details of these tests.
- 3.17 **Auxiliary Test** – As previously Approved with the CyberCat controllers, tests confirmed that the p/n 10-2413 city tie interface when connected to a control is capable of tripping a Gamewell local energy master box (P/N 21757-10) during simulated alarm conditions. Open and ground faults on the supervised local energy circuit were annunciated at the control.

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- 3.17.1 Once the Gamewell box was tripped, the control would not allow a full restoral or reset until the master box was reset. A trouble message was displayed on the keypad indicating a city tie trouble.
- 3.18 **Central and Remote Station** – As previously Approved with the CyberCat controllers, tests confirmed that the Cheetah Xi communicating with two or more Approved digital alarm communicator receivers as identified in the Listing Section 1.7 of this report via a signaling channel established through the public switched telephone network met the requirements of ANSI/NFPA 72 National Fire Alarm Code, 2002 Edition, for Digital Alarm Communication Systems.
- 3.18.1 It was verified that the DACT p/n 10-2528 (Bosch Security Systems, Inc. Model D9068) mounted within the control's enclosure can be configured so that when it is required to transmit a signal to the supervising station, it seized the telephone line at the protected premises and disconnected an outgoing or incoming telephone call and prevented use of the telephone line for outgoing telephone calls until signal transmission had been complete.
- 3.18.2 When an alarm was initiated at the signaling lines of the CyberCat 1016, the DACT obtained a dial tone, dialed the number of the DACR, obtained a verification that the DACR was ready to receive signals, transmitted the signals and then accepted confirmation that the DACR received the signal. The time for this transaction was less than the required 90 seconds.
- 3.18.3 It was verified that the DACT has the means to reset and retry when the first attempt to complete a signal transmission sequence was unsuccessful. It was verified that a failure to complete the connection did not prevent subsequent attempts to transmit an alarm where such alarm is generated from any other initiating device circuit or signaling line circuit, or both. Additional attempts were made until the signal transmission sequence was completed, up to a maximum of 10 attempts.
- 3.18.4 Fault conditions were simulated at the control unit. The trouble signals were received at the central station receiver in approximately 45 seconds which is satisfactory.
- 3.18.5 When primary power to the control was disconnected, the CyberCat 1016 annunciated the fault locally but a delayed AC power loss signal was transmitted to the DACR after six hours which is satisfactory.
- 3.19 **DACT Transmission Requirements:** It was verified that the following requirements apply to the DACT within the CyberCat 1016, CyberCat 254 and Cheetah Xi:
- 3.19.1 A DACT shall be connected to two separate means of transmission at the protected premises.
- 3.19.2 The DACT shall be capable of selecting the operable means of transmission in the event of failure of the other means.
- 3.19.3 The primary means of transmission shall be a telephone line (number) connected to the public switched network.
- 3.19.4 The first transmission attempt shall utilize the primary means of transmission.
- 3.19.5 Each DACT shall be programmed to call a second DACR line (number) when the signal transmission sequence to the first called line (number) is unsuccessful.

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- 3.19.6 Each DACT shall automatically initiate and complete a test signal transmission sequence to its associated DACR at least once every 24 hours. A successful signal transmission sequence of any other type within the same 24-hour period shall fulfill the requirement to verify the integrity of the reporting system, provided signal processing is automated so that 24-hour delinquencies are individually acknowledged by supervising station personnel.

IV MARKING

- 4.1 The following information appears on the adhesive label on the inside cover of the CyberCat Alarm Control and meets Standard requirements:
- Manufacturer's name and manufacturing location.
 - Model name and P/N.
 - System Operating Information.
 - Installation Manual Reference.
 - The FM Approval Mark.
- 4.2 A Serial No. is assigned for each control board. This is identified directly on the board.
- 4.3 The firmware Rev. 1.30 level for the CyberCat and Cheetah Xi is identified at the LCD of the control upon initial startup and reset.

V REMARKS

- 5.1 Installations shall comply with the relevant requirements of the latest edition of the National Electrical Code (ANSI/NFPA 70).
- 5.2 Installations shall comply with the latest edition of the manufacturer's instruction manual.
- 5.3 Control panels for automatic release of sprinkler or extinguishing systems are not considered FM Approved if they incorporate an accessible disable or abort switch. A key operated test switch, or a disable switch behind a lockable cover, or a manually operated momentary switch is permitted, but not recommended by FM Approvals for providing an intentional interruption of operation for servicing and testing.
- 5.4 When disconnecting the extinguishing system discharge for testing and/or maintenance, the extinguishing system must be isolated mechanically and not solely by electrically disconnecting the equipment.

VI FACILITIES AND PROCEDURES AUDIT

The manufacturing site at Fike Corporation in Blue Springs, MO is subject to follow-up audit inspections. The facilities and quality control procedures in place continue to be satisfactory to manufacture product identical to that examined and tested as described in this report.

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VII MANUFACTURERS RESPONSIBILITIES

- 7.1 Documentation considered critical to this Approval is on file at FM Approvals and listed in the Documentation File, Section VIII of this report. No changes of any nature shall be implemented unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The Approved Product Revision Report, Form 797, shall be forwarded to FM Approvals as notice of proposed changes.
- 7.2 On 100 percent of production, the manufacturer shall subject each transformer in the power supply of the CyberCat alarm control to a dielectric test where the connections shall withstand, for one minute and with no insulation breakdown, the application of 1000 V ac (or 1400 V dc) with respect to the protective ground. Alternatively, a test potential of 1200 Vac (or 1700 V dc) may be applied for at least one second.

WARNING: The dielectric test required may present a hazard of injury to personnel and/or property and should only be performed under controlled conditions, and by persons knowledgeable of the potential hazards of such testing to minimize the likelihood of shock and/or fire.

VIII DOCUMENTATION

The following drawings describe the Cheetah Xi are filed under Project ID 3023436.

Drawing No	Drawing Title	Revision
02-10944	PCB CYBERCAT	A
02-11101	SYS ENCL/SERV LABEL CYBERCAT	A
02-11198	SYS ENCL/SERV LABEL CYBERTCAT 254	A
02-11420	SYS ENCL/SERV LABEL CHEETAH XI	NC
06-356	CHEETAH PRODUCT MANUAL	0
10-2472	PCB ASSEMBLY CYBERCAT	A
10-2472-P	PCB ASSEMBLY UNTESTED SMT ASSEMBLY	D
10-2472-SCH	SCHEMATIC CYBERCAT	B
10-2482	PCB Assembly Network Card	NC
10-2482-SCH	Schematic Network Card Cybercat Cheetah	NC
10-2525	PCB ASSYEMBLY	A
10-2525-P	PCB ASSYEMBLY UNTESTED	B
10-2525-SCH	SCHEMATIC CYBERCAT 254	B
10-2542	PCB ASSEMBLY CHEETAH XI	N/C
10-2542-P	PCB ASSEMBLY UNTESTED	N/C

IX CONCLUSION

The equipment described in 1.7 meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

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EXAMINATION AND TESTING BY:

Noura Milardo, Edmond LaLiberte

PROJECT DATA RECORD:

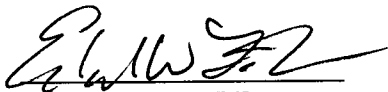
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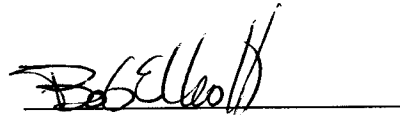
None

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