Installation Handbook

Autroprime Interactive Fire Detection System

Table of Contents

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 4

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 5

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 6

1. Introduction

1.1 About the Handbook

This document describes in detail the installation of the **Autroprime Interactive Fire Detection System** (hereby called **Autroprime**), a system for small-to-medium-sized applications.

1.2 The Reader

This handbook is intended for technical personnel.

1.3 Reference Documentation

The table below shows an overview of the complete technical documentation that is available in several languages:

Documents	Part number	File name
System Description	116-P-APRIME2-SYSTEM/XGB	aprime2system_xgb
Getting Started	116-P-APRIME2-GESTAR/EGB	aprime2gestar_egb
Installation Handbook	116-P-APRIME2-INSTAL/DGB	aprime2instal_dgb
Connecting Loop Units	116-P-CONNECTLOOPUNIT/DGB	connectloopunit_dgb
Configuration Handbook	116-P-APRIME2-CONFIG/EGB	aprime2config_egb
Operator's Handbook	116-P-APRIME2-OPERAT/FGB	aprime2operat_fgb
User Guide	116-P-APRIME2-USERGU/LGB	aprime2usergu_lgb
Wall Chart	116-P-APRIME2-WALLC/LGB	aprime2wallc_lgb
Menu Structure	116-P-APRIME2-MENUS/MGB	aprime2menus_mgb
Datasheet; Fire Alarm Control Panel BS-200	116-P-BS200/CGB	bs200_cgb
Datasheet; Fire Alarm Control Panel BS-200M	116-P-BS200M/CGB	bs200m_cgb
Datasheet; Repeater Panel BS-211	116-P-BS211/CGB	bs211_cgb
Datasheet; Information Panel BV-210	116-P-BV210/CGB	bv210_cgb
Datasheet; Fire Brigade Panel BU-210	116-P-BU210/CGB	bu210_cgb
Datasheet; Mimic Driver BUR-200	116-P-BUR200/CGB	bur200_cgb

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 7

2. Pre-installation

2.1 Location

The Fire Alarm Control Panel or Operator Panel must be located in, or nearby, the entrance according to local regulations and in consultation with the fire brigade.

Repeater Panels, Fire Brigade Panels and Information Panels must be placed according to local regulations and in consultation with the fire brigade.

2.2 Environmental Requirements

The equipment complies to environmental conditions of IEC-721-3-3 class 3k5.
Ambient temperature: -5 to +55 C

Degree of protection:
- BS-200: IEC-529/IP30
- BS-200M: IEC-529/IP32

2.3 Mounting Height / Space Requirement

To ensure optimal readability of the panels' display, the recommended mounting height of the panel top is approximately 175 cm above the floor.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 8

2.4 Mounting Alternatives

The Fire Alarm Control Panel (BS-200, BS-200M) is to be surface mounted onto the wall.

The Operator Panel (BS-210), which is an integrated part of the Fire Alarm Control Panel, can also be mounted separately outside a cabinet, either surface mounted onto the wall or mounted inside a 19'' rack or console.

All other panel types; Repeater Panel (BS-211), Fire Brigade Panel (BU-210), Information Panel (BV-210), Mimic Driver (BUR-200) and the "Larmlagringspanel" BU-211 are to be surface mounted onto the wall or mounted inside a 19'' rack or console.
For information on mounting alternatives for the maritime panel BS-200M and Mimic Cabinet BUR-200, refer to chapter 10.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 9

3. Panels, Brackets and Cabinet

The Autroprime system provides the following panels, brackets and cabinets:

	Fire Alarm Control Panel (BS-200, BS-200M) BS-200 is an integrated fire-alarm control panel for small-to-medium-sized installations. The panel serves as a stand-alone operating panel, or as a master panel in a networked system. Dimensions: HxWxD (mm): 420x346x140
	Cabinet (UE-1747) If the Operator Panel (BS-210) is mounted separately outside the cabinet, the door bracket is to be turned inside out, and fastened to the cabinet's door. Dimensions: HxWxD (mm): 420x346x140
	Operator Panel (BS-210) The panel is delivered as an integrated part of the Fire Alarm Control Panel but can also be mounted separately outside a cabinet onto a bracket (UD-731). Dimensions: HxWxD (mm): 310 x 220 x 45
	Repeater Panel (BS-211) The panel is identical to the the Operator Panel BS-210, with the exception of the alphanumeric keypad. Mounted onto a bracket (UD-731). Dimensions: HxWxD (mm): 310 x 220 x 45
	Fire Brigade Panel (BU-210) Mounted onto a bracket (UD-732). Dimensions (mm): HxWxD (mm): 154 x 310 x 45
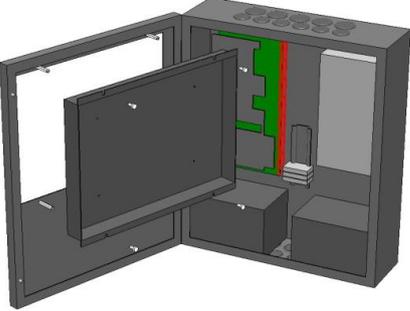
Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 10

		Information Panel (BV-210) Mounted onto a bracket (UD-732). Dimensions (mm): HxWxD (mm): 154 x 310 x 45
		Mimic Driver (BUR-200) The Mimic Driver is capable of driving 32 LEDs with series resistors on a mimic panel for additional indication of alarms. Provides also 8 standard monitored inputs. Dimensions: HxWxD (mm): 181x125x40 For maritime applications, the Mimic Driver BUR-200 is delivered in a cabinet (BUR-200M) providing 16 programmable relays.

In addition, the Autroprime system provides the *"Larmlagringspanel" BU-211* specifically designed for the Swedish Market.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 11

4. Interconnecting Panels on the Panel Bus

4.1 Overview

A maximum of 8 additional panels can be freely mixed and connected to the Fire Alarm Control Panel via the RS-485 panel bus, including Repeater Panels BS-211, Information Panels BV-210, Fire Brigade Panels BU-210 and Mimic Drivers BUR-200.

For information on cabling, refer to *Cable Connections*, chapter 9.1.

Fire Alarm Control Panel BS-200

BU-210

RS-485 Panel bus

BV-210

BS-211

ESPA 444 Communication Protocol or
NMEA protocol for VDR systems (RS-232, RS-422/485)

Modbus RTU protocol (serial/ethernet)
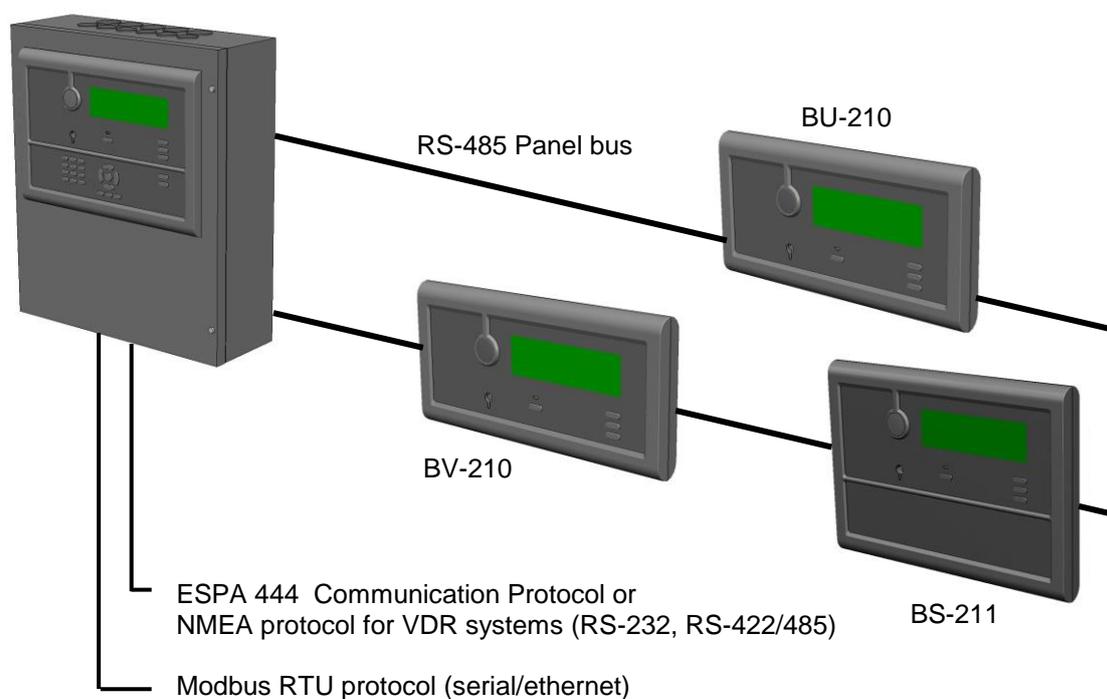
4.2 Cyber Security

To ensure cyber security, we strongly recommend that the Ethernet port is not connected to the public internet.

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Autronica Fire and Security AS

Page 12

5. Mounting Instructions

- Find the text foils in the relevant language for the panel, and insert the textfoils in the correct locations (there are two different foils). Through the small hole near the slot, use a small screwdriver or similar to slightly bend the edge (approx. 1mm) of each foil until the edge slips behind the opening of the slot. An overview of all foils is shown in Appendix 17.1.

Refer to the relevant mounting procedure below (A, B or C), consult the drawings and follow the steps.
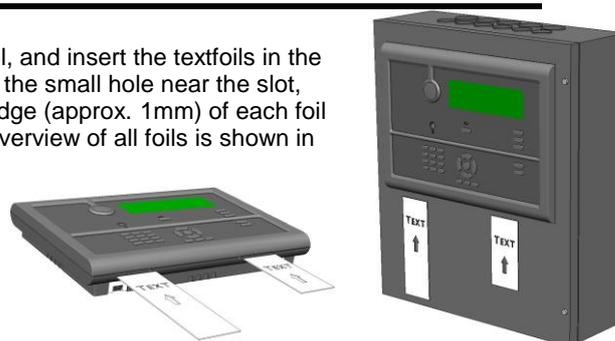
Step	A) Mounting the Fire Alarm Control Panel (BS-200. For information on BS-200M, see chapter 10)
1A	• The cabinet has 3 mounting holes located at the rear. The upper holes are of key-hole-type. • Insert the 2 upper screws in the wall according to the drawing. • Open the cabinet's front door and hang the cabinet onto the screws. • Insert the lower screw, then tighten all screws.
2A	• Place the 2 batteries inside the cabinet according to the drawing. Fasten them with strips.
3A	• Connect all external cables to the correct terminal points. Refer to chapter **Error! Reference source not found.**.

Step	B) Mounting the Operator Panel separately outside a cabinet (Operator Panel BS-210, an integrated part of BS-200)
1B	• The cabinet has 3 mounting holes located at the rear. The upper holes are of key-hole-type. • Insert the 2 upper screws in the wall according to the drawing. • Open the cabinet's front door and hang the cabinet onto the screws. • Insert the lower screw, then tighten all screws.
2B	• Unscrew the 4 screws which connect the panel to the cabinet's front door. • Remove the Operator Panel with its bracket mounted. • Remove the bracket from the Operator Panel. • Disconnect the internal cable from the Operator Panel.
3B	• For cosmetic reasons, unscrew the extended nuts from the door bracket (which the Operator Panel was fastened to), and turn the door bracket inside out, then fasten it to the cabinet's door. Note: The maritime panel BS-200M requires the use of a rubber seal (UY-108) between the door bracket and the cabinet's front door. • Plug the holes by the four plastic studs.
4B	• Mount the Operator Panel's bracket onto the wall.
5B	• Connect all external cables to the correct terminal points. Refer to chapter 9.9 and 9.10
6B	• Place and centre the lower part of the panel onto the lower part of the bracket, then simply push the upper part of the panel towards the bracket until it snaps on.

Step	C) Mounting all other panels (Repeater Panel BS-211, Fire Brigade Panel BU-210, Information Panel BV-210)
1C	• Set the correct address (1-9) by means of the Rotary switch located on the rear side of the panel (refer to Addressing Panels in the next chapter).
2C	• Mount the panel bracket onto the wall.
3C	• Connect all external cables to the correct terminal points. Refer to chapter **Error! Reference source not found.**.
4C	• Place and centre the lower part of the panel onto the lower part of the bracket, then simply push the upper part of the panel towards the bracket until it snaps on.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 13

1A

2A

316
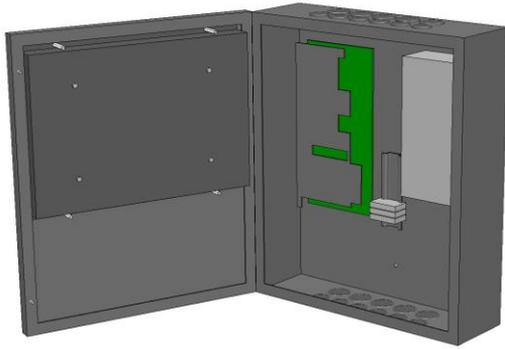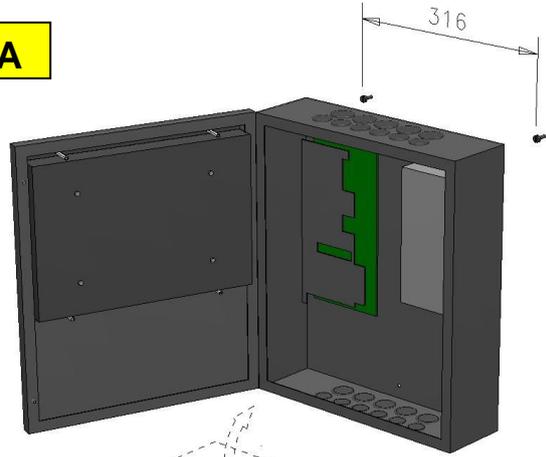
For adequate access to the inside of the panel when the door is opened, make sure that the distance between the panel's left side (front view) and the adjacent wall is approximately 30 cm.
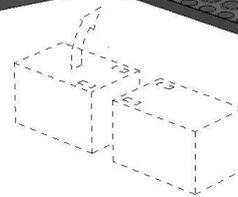
1B
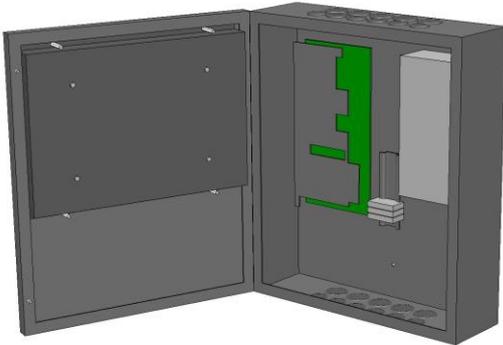
2B
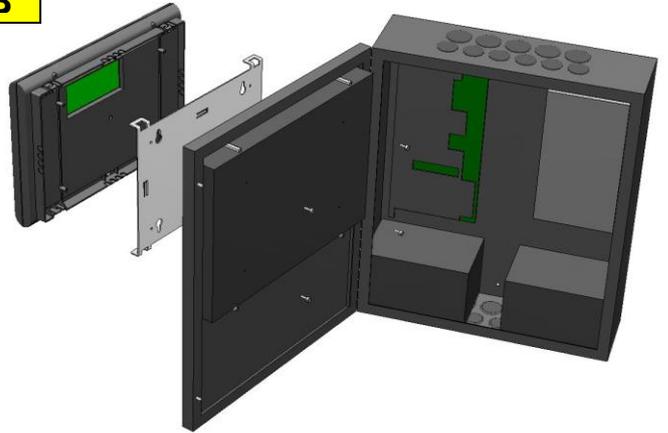
3B
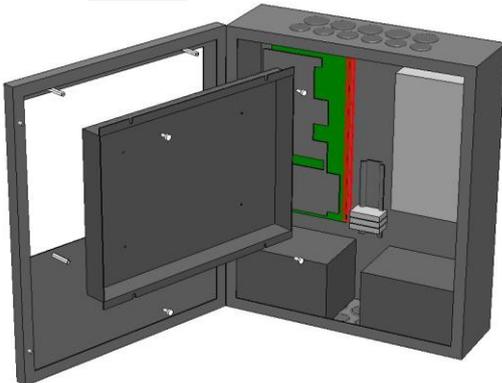
4B
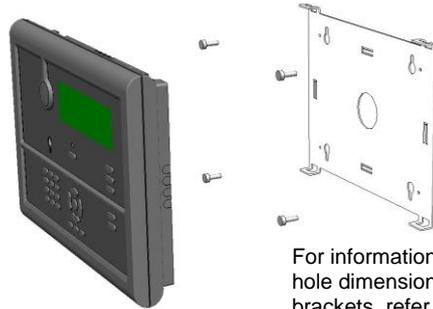
For information on hole dimensions for brackets, refer to chapter 5.

4C

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Autronica Fire and Security AS

Page 14

6. Addressing Panels

6.1 Rotary Switch on Panels

All Autroprime panels (BS-200, BS-200M, BS-211, BU-210, BV-210) must be assigned addresses by means of the rotary switch located on the rear side of the panel. The addresses must be set before mounting.
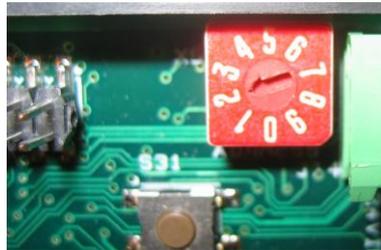
6.2 Addressing the Fire Alarm Control Panel (BS-200)

The main Fire Alarm Control Panel (BS-200, BS-200M) with the integrated Operator Panel BS-210 must always have address 0 (the arrow pointing straight downwards). Address 0 is preset from the factory.

Note that only 1 Operator Panel BS-210 (either as an integrated part of Fire Alarm Control Panel BS-200 or as a separate panel mounted outside a cabinet) can be connected to the panel bus.

6.3 Addressing other Panels

All other panels connected to the RS-485 Panel Bus, including Repeater Panel BS-211, Fire Brigade Panel BU-210, Information Panel BV-210 and "Larmlagringspanel BU-211" have addresses from 1-9.

6.4 Addressing Mimic Drivers

To address the Mimic Drivers the X2 Panel Bus Address Switch is used. If S2.7 is set to Master, X2 sets the panel bus address. If S2.7 is set as slave, X2 sets the RS-485 daisy-chain slave address. The range for the switch is 1-9.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 15

7. Mounting Drawings

7.1 Hole Dimensions - Mounting Bracket for BS-210 and BS-211

The Operator Panel BS-210 (an integrated part of the Fire Alarm Control Panel BS-200) can be surface mounted onto a bracket on the wall outside the Fire Alarm Control Panel's cabinet.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 16
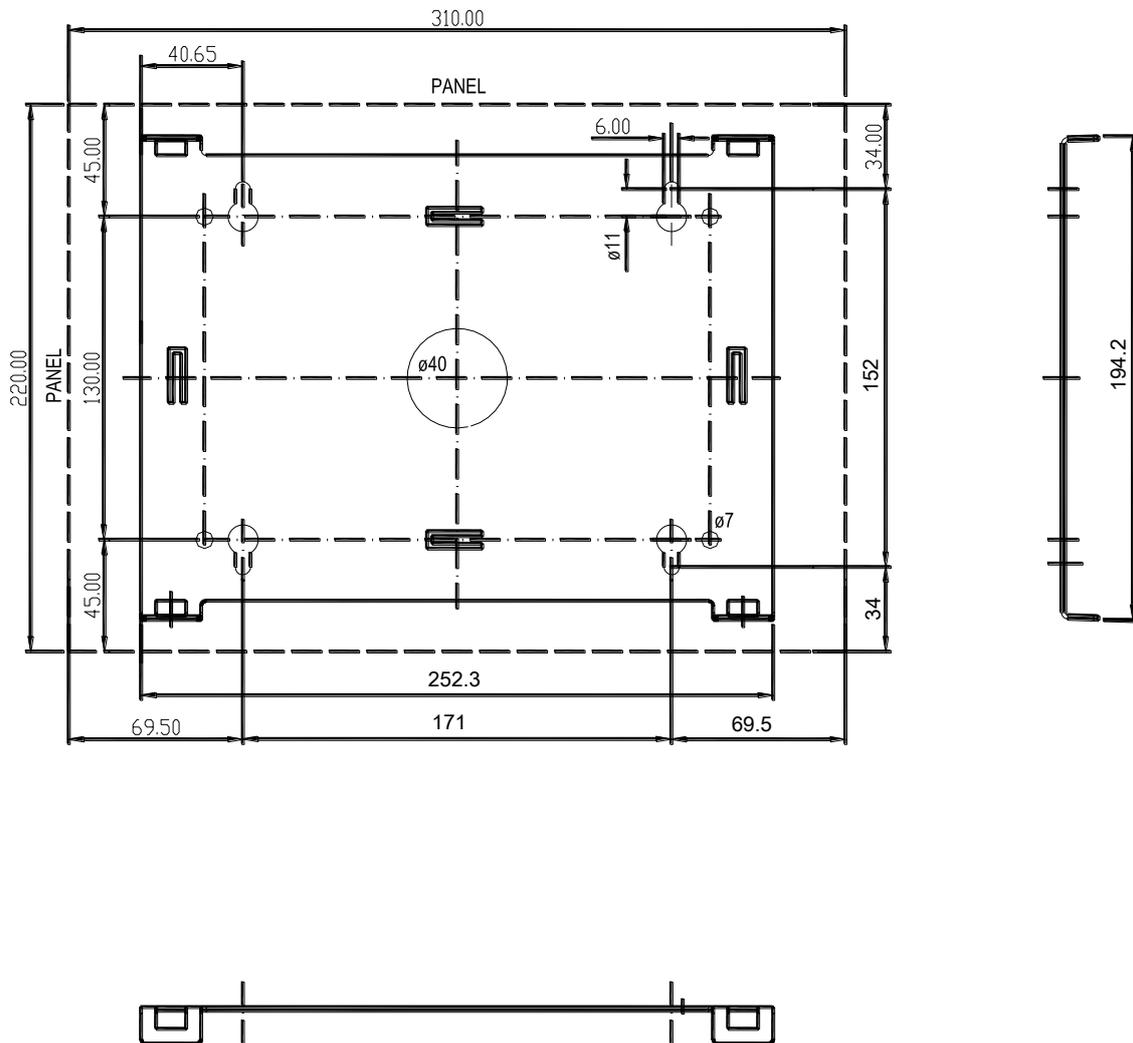
7.2 Hole Dimensions - Mounting Bracket for BU-210, BU-211 and BV-210

The Repeater Panel (BS-211), Fire Brigade Panel (BU-210), Information Panel (BV-210) and "Larmlagringspanel" BU-211 are to be surface mounted onto a bracket on the wall (or mounted inside a 19'' rack or console).

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 17
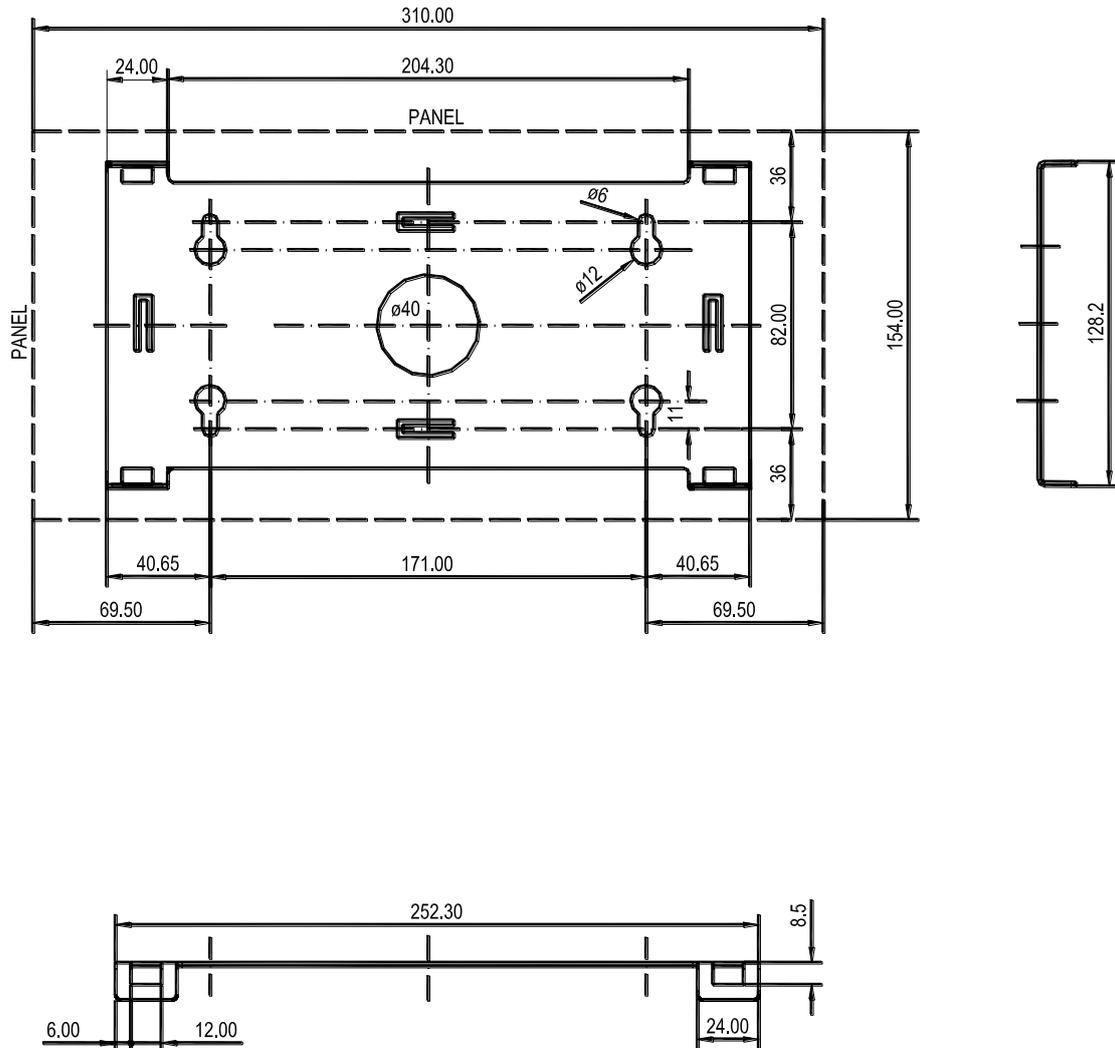
8. Cable Specifications

8.1 Calculating the Current Consumption

NOTE:
As a general rule, the maximum current consumption for all loop units on a detection loop must not exceed the configured current consumption.

In the system service menu (Unit Configuration/Detection Loops) it is possible to limit the maximum possible current consumption for a selected detection loop. The following different default settings are possible: 100mA, 150mA, 200mA, 250mA, 300mA, 350mA and 400mA.

The current consumption per device is found in the data sheets of the respective units.

Always calculate for worst case, normally during alarm condition whene LEDs, sounders, strobes are activated.

8.2 Tables

The tables in this chapter give the wire dimension in *square* millimeters or AWG (American Wire Gauge) for various cable lengths. Please refer to national/local standards for your country. Data may change. Please check with your local manufacturer.

If multi-stranded cables are used, cable crimps shall be used.

8.2.1 Table for Low Current Detectors and I/O units

Detection Loop current setting (mA)	Max cable resistance (ohm)	Cable length (m) for AWG 20 (0,5mm²)	Cable length (m) for AWG 18 (0,75mm²)	Cable length (m) for AWG 17 (1,0mm²)	Cable length (m) for AWG 15 (1,5mm²)	Cable length (m) for AWG 13 (2,5mm²)
100	105	1500	2250	3000	4500	7500
150	58	829	1243	1657	2486	4143
200	35	500	750	1000	1500	2500
250	21	300	450	600	900	1500

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 18

8.2.2 Table for High Current Detectors and I/O units

Detection Loop current setting (mA)	Max cable resistance (ohm)	Cable length (m) for AWG 20 (0,5mm²)	Cable length (m) for AWG 18 (0,75mm²)	Cable length (m) for AWG 17 (1,0mm²)	Cable length (m) for AWG 15 (1,5mm²)	Cable length (m) for AWG 13 (2,5mm²)
100	112	1600	2400	3200	4800	8000
150	78	1114	1671	2229	3343	5571
200	55	786	1179	1571	2357	3929
250	40	571	857	1143	1714	2857
300	30	429	643	857	1286	2143
350	23	329	493	657	986	1643
400	18	257	386	514	771	1286

8.2.3 Onboard I/O and Power

	Maximum resistance / capacitance	Wire Dimensions (examples)		Maximum cable length	Remarks
	(Ω / µF)	(mm²)	(AWG)	(m)	
Inputs, Monitored				10m	
Inputs, Non-monitored				50m	
Output, Monitored (Alarm Sounder Circuits)	- -	2 x 1,5 2 x 0,78	15 18	- -	Determined by cable loss (0,5A maximum load)
Output, Relay				-	
Output, O.C				100m	
Battery	- - -	2 x 2,5 2 x 1,5	13	5 m 3m	Maximum battery cable length is 5m Maximum cable resistance is 0.05 ohm
Mains	-	3 x 1,5	15	-	-

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 19

8.2.4 Panel Bus and Serial Port

Panel Bus	Capacitance pr. 1km cable	Maximum cable segment length
	Capacitance < 200 nF Capacitance < 100 nF	< 600 m < 1000 m Cat 5 or better
		Cable shall be twisted pair, characteristic impedance 100 ohm.
Panel Bus **Power supply**	2-wire 24V supply: Calculation vs power loss The power loss in these cables has to take into consideration the maximum current at startup due to the Lamp test, which is 300 mA. Cable loss shall be limited to ensure at least 18V supply to each panel in this situation.	
RS 232	For cabinet internal connections only, limited to 10m. For USCG installations the length is limited to 6m (20 feet).	
RS485/422	Shielded cable is required if cable is >3m. Cable shall be twisted pair, 100 ohm characteristic impedance (Cat 5 cable recommended). Maximum length 1000 meters. For USCG installations the length is limited to 6m (20 feet).	

8.3 General Considerations

The maximum cable length is determined by both cable loss and the at-site designed power consumption. Increasing current implies a demand for less cable loss, hence increased copper area or reduced cable length.

Note: The current consumption of LED indicators (on detectors or loop units) in the event of an alarm has to be included.
The current consumption of other loads has to be included (for example, loads applied to the output connection of detectors).
Units with varying current consumption, like sounders or strobe devices have to be included according to the configured setting, for example, the sound level may vary.

A 25% margin should be added for safety, to ensure correct operation in case of excessive current consumption, degraded connections (ageing), etc.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 20

8.4 The Panel Bus Cable Requirements

8.4.1 Characteristic Impedance and Signal Attenuation

When dealing with specification of the Panel Bus cable, the important issues are the characteristic impedance and the attenuation of the signal at approximately 100 KHz. These parameters become more important the longer the cable is.

The parameters are defined by the geometry of the cable. Proper characteristic impedance is best obtained by a cable with twisted pairs. For short communication paths (less than approximately 100m) the characteristic impedance is not that important, and attenuation is low enough for most cables. However, the twisting improves the cable's ability to withstand external interference, and a twisted cable should be preferred when the cable runs in the vicinity of power cables and power devices as generators, transformers etc.

Longer paths require twisted pair cable and 100 ohms characteristic impedance, Cat 5 or similar cable intended for RS485 transmission.

The characteristic impedance shall be (at 100KHz:) 100 ohm +/- 15 ohm. Note that the characteristic impedance has nothing to do with the resistance of the cable. It is a property related to high-frequency transmission, regardless of its length. Typical examples are antenna cable (300 ohm), video cable (75 ohm).

Attenuation is defined by the wire to wire capacitance mostly, as long as the wire is at least 0.5mm2. The total attenuation of the cable length must not exceed 9 dB @ 100KHz. If attenuation is not specified, normally the capacitance is defined. The capacitance shall not exceed the specified value in order to achieve the total communication length.

8.4.2 High-voltage and Noisy Environments

In high-voltage environments (power plants, electrical machinery etc.) it is recommended that shielded cable is used. In this case, the shielding of the cable should only be connected at one end to avoid ground loops. If high-frequency noise is expected (>10MHz), then both ends should be connected. This may be present close to radio transmitting equipment or similar.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 21

8.4.3 Cable Length and Power Consumption

The maximum cable lengths are defined for each segment between panels. Each panel has a built-in electrical repeat of the signal. Power loss, however, is defined from the maximum power consumption along the cable.

Note: RS-485 Panel Bus contains both the RS-485 signalling and the redundant power to all panels. Two four pair cable will be suitable.

Note: For redundancy, the power supply has to be supplied by two physically separated cables in a loop structure to maintain connection in case of damage to one cable. See drawing (Simplified cable routing between panels).

NOTE: If separate power supplies are installed locally to source the panels, the following shall be ensured:

- The local power supply shall be galvanically isolated from its local power source and earth.
- The reference (0V) of this power shall be connected to 0V of the Fire Alarm Control Panel to ensure same reference for all signaling nodes. As described in the tables below, one of the pairs may be used for this.

In this case, an earth fault at this panel's power supply will be signaled as a global earth fault by the Fire Alarm Control Panel.

The local power supply to the panel should include a local backup source in case of loss of mains supply. In some installations it may be required (by local regulations) that the power supply includes a monitoring of internal condition in accordance to EN-54-4, and that it signals a fault if present. The wires from the power supply's fault relay output has to be connected to J23, replacing the jumper. A break in this circuit path makes the panel signal a fault in the system. Total loss of power will be signalled in the system as a missing panel.

	Panel 1 (BS-200)	Cable 1 From Fire Alarm Control Panel to external panel		Panel 2 (BS-210/ BU-210 etc)
J4/9	Panel Bus In A	Pair 1+	J14/5	A_1
J4/10	Panel Bus In B	Pair 1-	J14/6	B_1
J1/5	+24V out 1	Pair 2 (both wires)	J14/1	24V IN 1
J1/6	0V out 1	Pair 3 (both wires)	J14/2	0V IN 1
	Not connected	Pair 4		Not connected

	Panel 2 (BS-210/BU-210 etc)	Cable 2a From external panel (n) to next external panel (n+1)	Panel 3 (BS-210/ BU-210 etc)	Terminals
J13/5	A_2	Pair 1+	A_1	J14/5
J13/6	B_2	Pair 1-	B_1	J14/6
J13/1	24V IN 1	Pair 2 (both wires)	24V IN 1	J14/1
J13/2	0V IN 1	Pair 3 (both wires)	0V IN 1	J14/2
	Not connected	Pair 4	Not connected	

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 22

	Panel 3 (BS-210/BU-210 etc)	Cable 2b Redundant Power between external panels	Panel 1 (BSA-200/J1)	Terminals
	Not connected	Pair 1	Not connected	
J13/3	24V IN 2	Pair 2 (both wires)	24V IN 2	J14/3
J13/4	0V IN 2	Pair 3 (both wires)	0V IN 2	J14/4
	Not connected	Pair 4	Not connected	

	Panel 2 (BS-210/BU-210 etc)	Cable 3 From last external panel and back to Fire Alarm Control Panel	Panel 1 (BS-200)	Terminals
J13/5	A_1	Pair 1+	Panel Bus Out A	J4/11
J13/6	B_1	Pair 1-	Panel Bus Out B	J4/12
J13/3	24V IN 2	Pair 2 (both wires)	+24V out 2	J1/7
J13/4	0V IN 2	Pair 3 (both wires)	0V out 2	J1/8
	Not connected	Pair 4	Not connected	

See drawing, chapter 9.12.

8.5 Calculation of Power Consumption and Cable Loss

The fuses determine the maximum power load. The 24V cabling should be dimensioned according to the power consumption and the smallest voltage during load.

CAUTION

Sourcing of power shall only be supplied via the fused outputs (+24V Out 1- and Out 2) from the Fire Alarm Control Panel. Connecting to battery or charger is not allowed as the control of the charger voltage and current will become malfunctional.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 23

8.6 Power Supply and Battery Capacity

The battery capacity must be calculated according to the total power consumption all units require in case no mains power is supplied. Note that national/local requirements for battery backup may vary.

General Rules
- Add all power loads in the Quiescent condition. The total current consumption should then be multiplied with the required hours of battery backup (typically 24 hours).
- Then add the additional load in Alarm condition. As above, multiply by the hours required for this condition (typically 0,5 hours)

The total required battery capacity which is now found needs a margin of about 15 % for the life cycle of the battery.

In addition, the total current supplied by the fuses +24V Out1 and +24V Out2 shall be safely below the 1.0A limit. The available total current from the charger is 5,0A, and care must be taken to ensure that the total charging current together with the overall load does not exceed 5,0A. Also, the charging current available shall be capable of charging the batteries fully within 24 hours.

Example
(24 hours Quiescent condition + 0,5 hours Alarm condition)

Consumers	Quiescent (mA)	Alarm (mA)	Quiescent 24 hours (Ah)	Alarm 0,5 hours (Ah)	Total (Ah)
BS-200	200	310	4,80	0,16	4,96
200 detectors	60	90	1,44	0,05	1,49
30 loop units	9	180	0,22	0,09	0,31
Panel Bus					
BU-210	20	60	0,48	0,03	0,51
BV-210	20	60	0,48	0,03	0,51
Sounders					
Output 1, 10 pcs	0	200	0	0,10	0,10
Output 2, 10 pcs	0	200	0	0,10	0,10
External load	100	200	2,40	0,10	2,50
			9,82	0,66	Total: 10,48Ah
		15% margin			~12Ah

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 24

9. Cable Connections

9.1 Cabling - Overview

Consult the drawings on the next pages and follow the procedure below.

NOTE: For specific information on the installation and cable connections for *maritime* installations, refer to chapter 10.

Fire Alarm Control Panel (BS-200, BS-200M)

- Insert the rubber glands (delivered with the panel) into the suitable cable inlets at the top. This should be done regardless of whether the cables are to be fed through the cable inlets at the top or bottom. If the external cables are to be fed from the bottom, remove the knockouts from the cable inlets that are to be used. Note: If the cables are fed from the bottom, batteries cannot be placed in the cabinet.
- Feed all the external cables into the cabinet through the suitable cable inlets.
- Fasten the cable by strips to the rear of the panel.

- Refer to *Description of Terminal Points – Main Board,* chapter 9.9.
- Connect the detection loop cables to the correct terminal points.
- Connect the panel bus cables to the correct terminal points (if several panels are interconnected).

- Interconnect the batteries with the small cable delivered with the cabinet (see drawing).
- Connect the internal temperature sensor cable to the correct terminal points (see drawing), then fasten the sensor to the battery with a piece of tape.

- For information on the connection of other peripheral units, refer to *Description of Terminal Points – Main Board,* chapter 9.9

> *NOTE: In the fixed mains wiring to the panel a two-pole disconnect device must be provided to disconnect the equipment from the power supply when servicing is required. Normally, this switch is a two-pole automatic fuse located in the fuse terminal box at the premises. This fuse location must be marked "Fire Alarm System". The isolation of the mains wiring must be of either inflammability class V2 or the wiring has to be fixed to the cabinet separated from all other cables.

All other panels (Operator Panel BS-210, Repeater Panel BS-211, Fire Brigade Panel BU-210, Information Panel BV-210)

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 25

If in-wall cabling is used, feed the external cables through the hole of the bracket before mounting the panel (the cables should preferably stick out approximately 25cm from the surface of the wall).
or;
if on-wall cabling is used, remove the appropriate knockouts on the top, bottom, left or right hand side of the panel.

Before mounting the panel on the bracket, connect all external cables to the correct terminal points (the panel bus cable). Refer also to *Description of Terminal Points – Main Board,* chapter 9.9

- Verify that all cables are correctly and properly connected before connecting the mains cable and the internal battery cables.

- Verify that the switchsetting on dipswitch S2.4 is correct according to the panel in question (land market/BS-200 or maritime market BS-200M). Refer to dipswitch S2.4.

Switch	Description
S2.4	Market selection. Select between Land (BS-200) and Maritime (BS/200M) Land: S2.4 ON Maritime: S2.4 OFF

9.2 Voltage Selection 115/230VAC

- Make sure that the mains power is *not* connected.

POWER OFF!

- Use a screwdriver to slide the switch on the power supply to the correct position according to the appropriate voltage (115/230VAC).

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 26
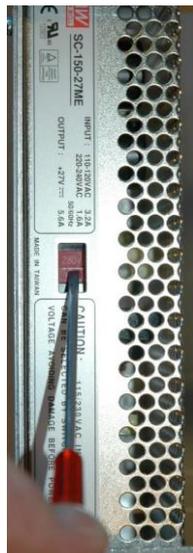
9.3 Overview Internal Cable Layout
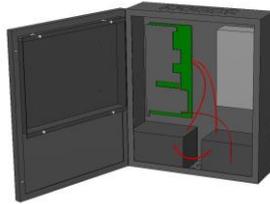
NOTE: For specific information on the installation and cable connections for *maritime* installations, refer to chapter 10.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 27
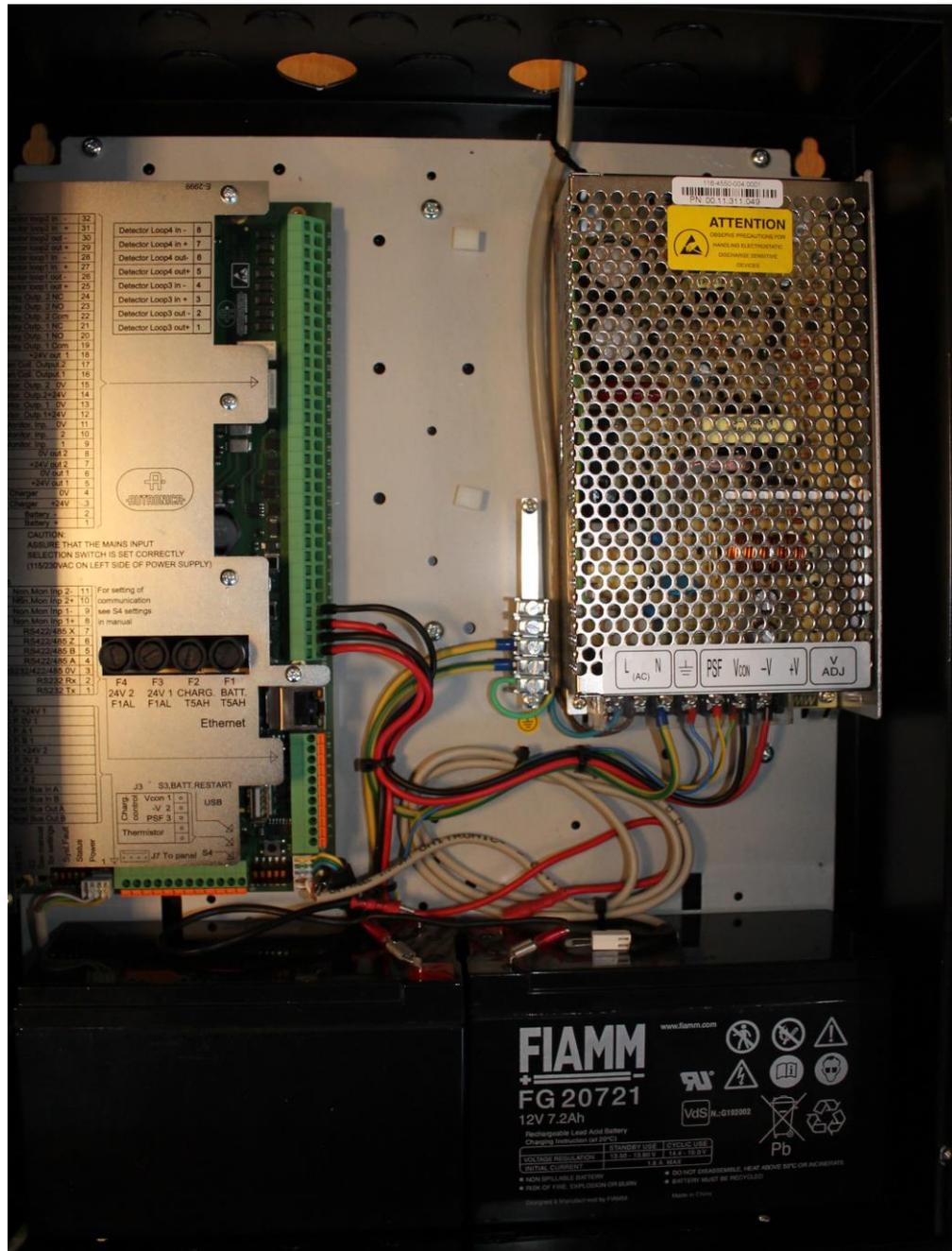
9.4 Battery Connections

NOTE: For specific information on the installation and cable connections for ***maritime*** installations, refer to chapter 10.

- Connect the black cable from the connector on the main board to the minus pole (black) on the battery on the left side.
- Connect the red battery cable to the plus pole (red) on the battery on the right hand side.

Black wire to minus pole -　　　　　*Red wire to plus pole +*

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 28

Fasten the temperature sensor to the battery with a piece of tape as shown.

- Connect the internal temperature sensor cable to the correct terminal points.
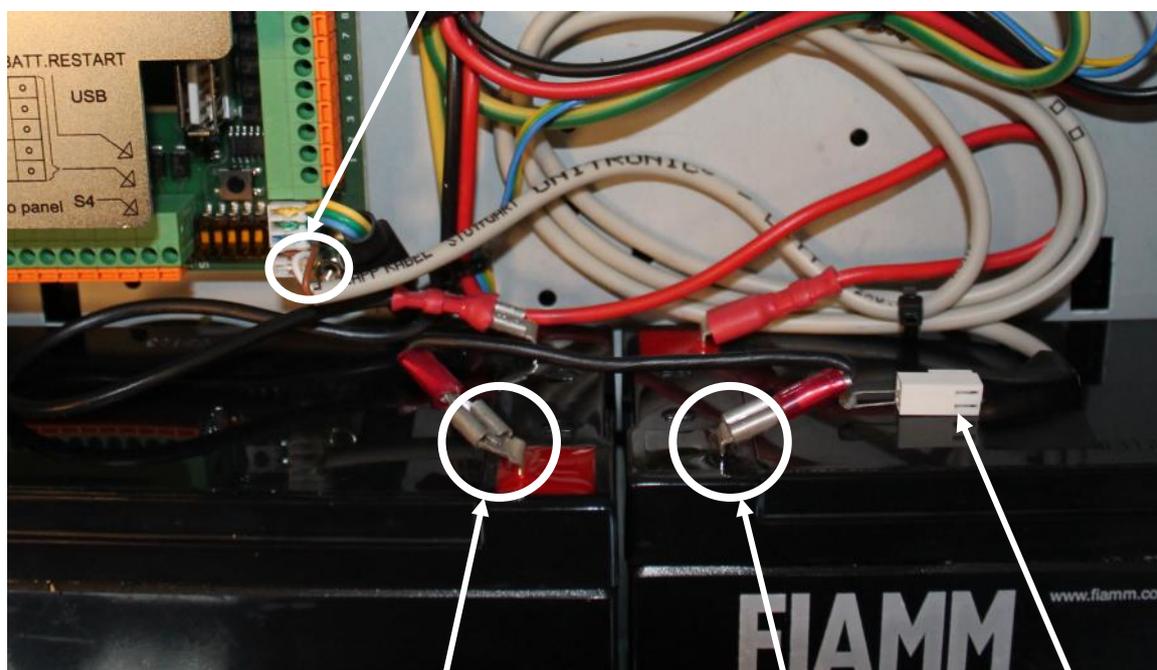
Plus pole +   *Minus pole -*   *Temperature Sensor*

- Interconnect the other plus pole and minus pole on the batteries with the cable delivered with the cabinet.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 29

9.5 Connections to Power Supply / Mains Power

NOTE: For specific information on the installation and cable connections for **maritime** installations, refer to chapter 10.
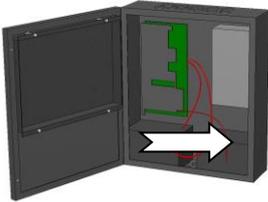
Each terminal point is indicated on the power supply's label straight above the terminal points. For protection purposes a plastic cover is placed on top of the terminal points.

- Connect the mains power cable to the correct terminal points (L and N)

  Note that the isolation must be kept on the mains cable close up to the terminal points (L and N).

*Mains Power
Terminal Points
(L and N)*
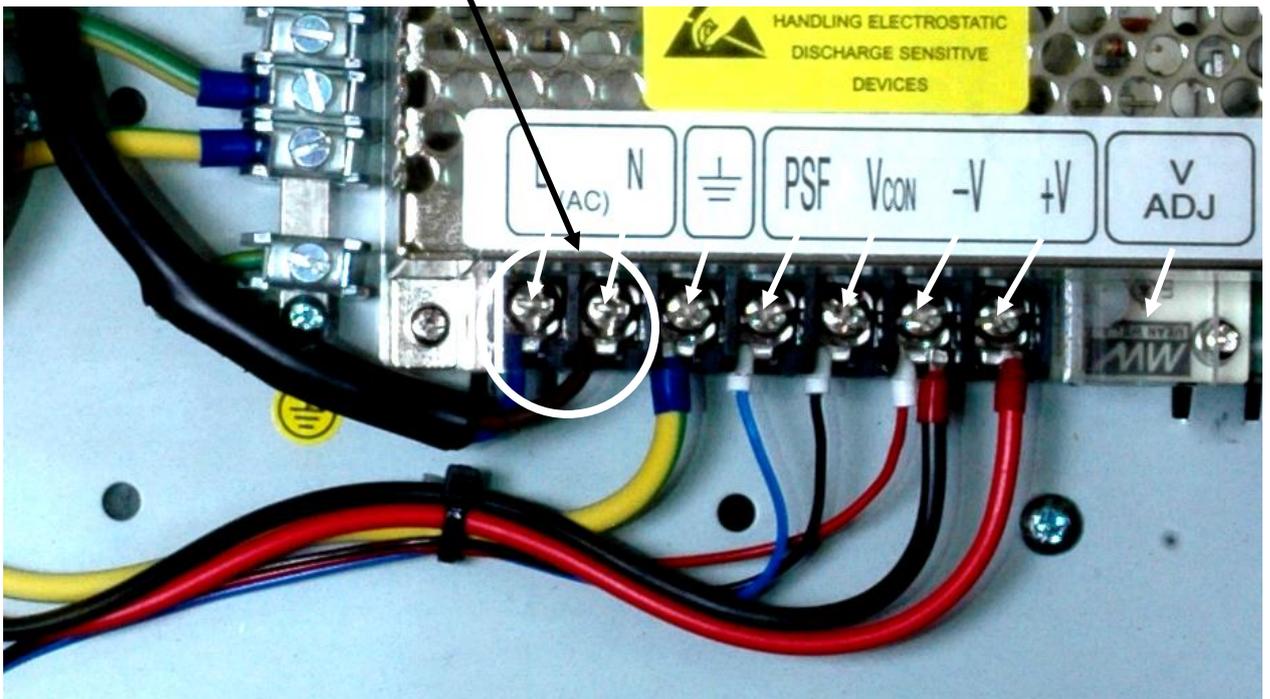
Caution
Do NOT touch the potensiometer labeled V, ADJ unless the charger needs to be calibrated (see chapter 16, Charger Calibration).

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 30

9.6 Fuses
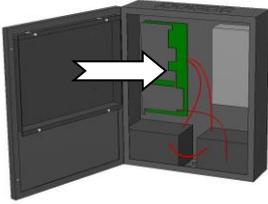
The Fire Alarm Control Panel is provided with 4 fuses, easily accessible from the main circuit board inside the cabinet.
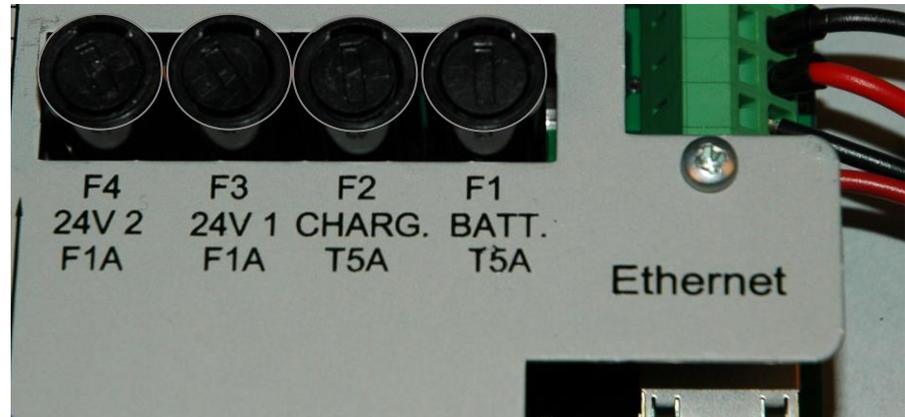
Fuse	Value	Description
F4	1A Fast	24V output 2. Used to power external equipment. Typical application will be to power the panel bus +24V 2
F3	1A Fast	24V output 1. Used to power external equipment. Typical application will be to power the panel bus +24V 1
F2	5A Slow	Battery charger fuse.
F1	5A Slow	Battery connection fuse. Used to cut the connection between the battery and the charger in the event that the battery shorts out.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 31

9.7 Connection of External DC Power

The default power configuration for Autoprime is mains power (230V/110V) and 24V batteries. If mains power not is available, it is possible to power the system with single or double external 24V DC.

External DC power for Autoprime will not be in accordance with EN54 part 4 unless the external power supply is approved for EN54 part 4.

To enable external 24V power solution for Autoprime, BSA-200A dip switch S2.3 must be set ON, and connector on J3.1 – J3.3 must be removed.
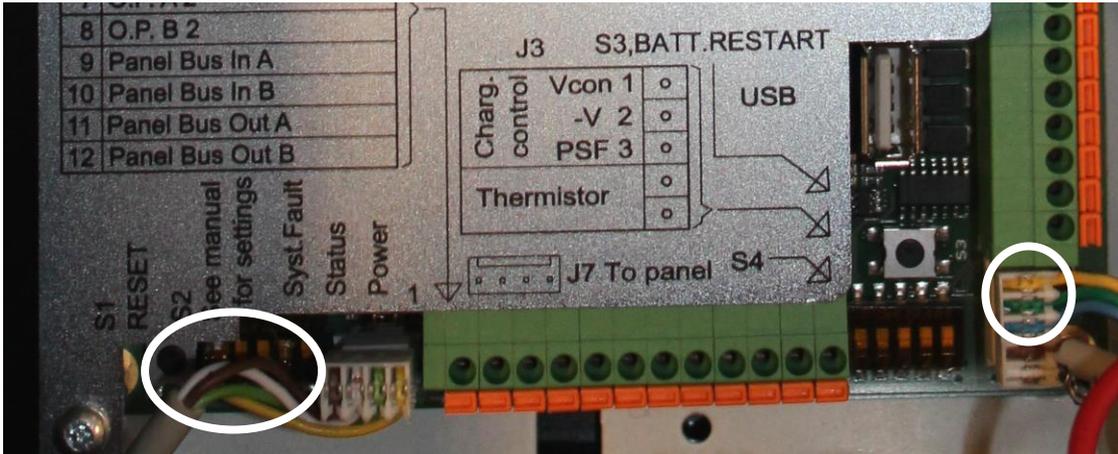
When a single 24V DC input is used, it shall be connected to J1.3/J1.4

When a second 24V DC input is available, it shall be connected to J1.1/J1.2, and dip switch S2.5 must be set in ON position.

Note that there is no monitoring whether external 24 V is connected on J1.3/J1.4 or J1.1/J1.2 or both. All monitoring related to battery and fuses F1 and F2 is disabled. Fuses F1 and F2 must be checked manually at regular time intervals to ensure that the system is working properly.

Whenever dipswitch S2.3 or S2.5 is changed the system must be HW rebooted to read the new settings. Reboot by pressing the HW reset button S1 or powering the system off and then on.

When the system has started, the configuration must be saved and the system restarted.

If there is a conflict between the actual power source and the switch settings on dipswitch S2.3/S2.5, the fault message "Power source conflict" will appear.

If there is a conflict between the configuration and the settings on switch S2.3, the fault message "Power source config conflict" will appear. Voltage for the external inputs should be a standard 24 VDC within the range of 22 – 28 VDC. The system will give the user a warning if the external power is outside system limits.

Installation Handbook, Autoprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 32

9.8 Terminal Points Overview – Main Board

Installation Handbook, Autoprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 33
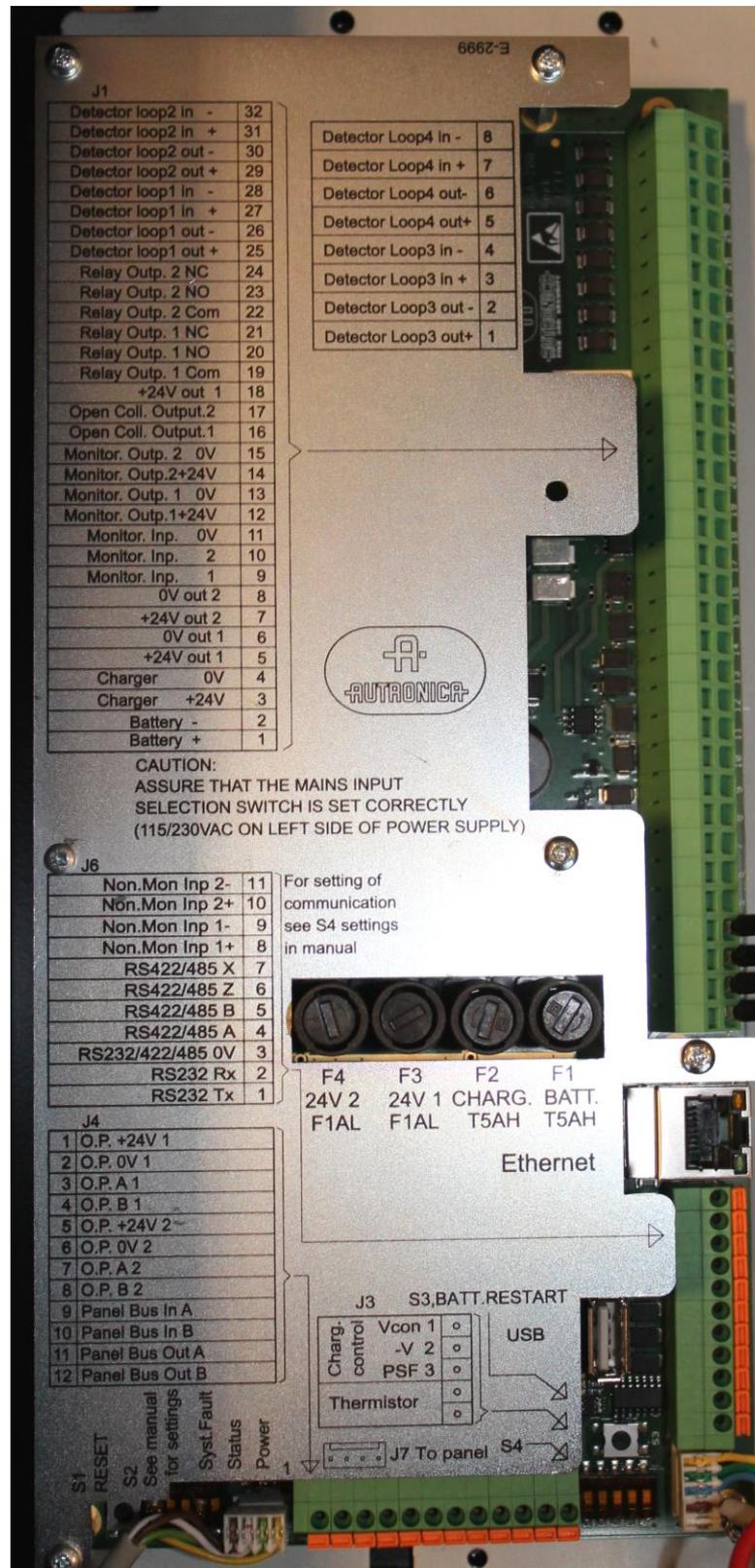
9.9 Description of Terminal Points – Main Board

9.9.1 Main Terminal Block J1

NOTE: For specific information on the installation and cable connections for *maritime* installations, refer to chapter 10.

The main spring-loaded connector block J1 is capable of up to 4mm2 solid core cables or up to 2.5mm^2 multi-stranded core cables. If multistranded cables are used, cable crimps should be used.

Note that first connecter J1.1 is physically located at the lower end of the terminal block (refer to the picture on the previous page).
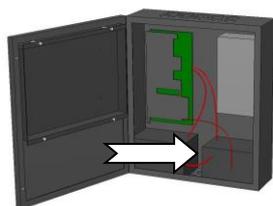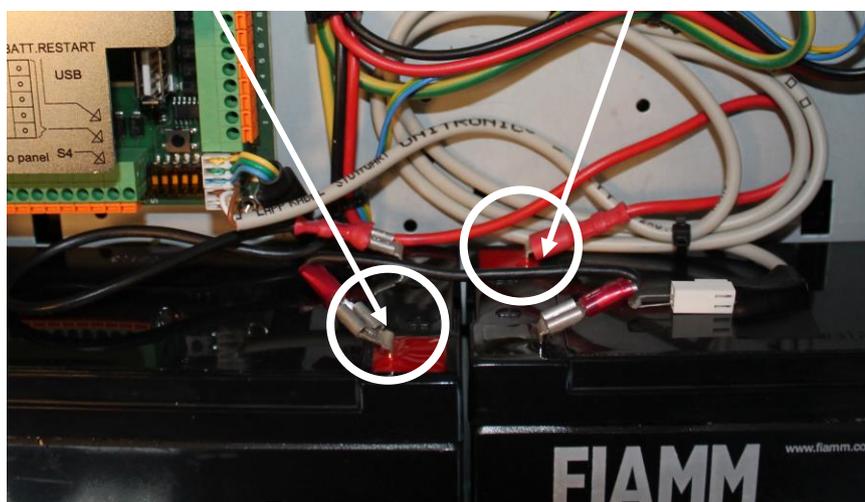
J1-	Description			Internal	External
1	Battery +	Fuse F1, T5AH	For connection of standby battery	1 +24V 2 0V	1 2
2	Battery -				
3	Charger +24V	Fuse F2, T5AH	For connection of internal charger	3 +24V 4 0V	Battery charger or 24V supply
4	Charger 0V				
5	+24V out 1	Fuse F3 F1AL. Max 1A (includes output 18)	Power to panel bus. (24V1).	5 +24V 6 0V	
6	0V out 1				
7	+24V out 2	Fuse F4 F1AL. Max 1A	Power to panel bus (24V2).	7 +24V 8 0V	
8	0V out 2				
9	Monitored Input 1		User configurable input. Monitored for open and short circuit. 2k resistor to 0V. Activates at 910 ohm to 0V.		
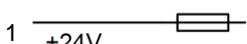
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Page 34

J1-	Description			Internal	External
10	Monitored Input 2		User configurable input. Monitored for open and short circuit.2k resistor to 0V. Activates at 910 ohm to 0V.		
11	Monitored Input 0V		0V reference for Monitored Inputs 1 & 2		
12	Monitored Output 1 +24V	0,5 A resettable fuse.			
13	Monitored Output 1 0V				
14	Monitored Output 2 +24V	0,5 A resettable fuse.	Default configured as Fire Alarm Device Output. Monitored for short and open circuit. 2kohm end resistor. Max 500mA.		
15	Monitored Output 2 0V				
16	Open Collector Output 1		User configurable Open collector output. Non-monitored Switches to 0V at activation. Max.0,5A		
17	Open Collector Output 2		User configurable Open collector output. Non-monitored Switches to 0V at activation. Max.0,5A		
18	Auxiliary1 +24V out	Same fuse as J1.7	Supply voltage for loads connected to Open collector outputs 1 and 2. Max.1A		

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 35

J1-	Description			Internal	External
19	Relay Output 1 Com				
20	Relay Output 1 NO				
21	Relay Output 1 NC		Default configured as Fire Alarm Routing Equipment. (FARE) Potential free change-over contact. Non-monitored. Max. 30VDC/1A		
22	Relay Output 2 Com				
23	Relay Output 2 NO				
24	Relay Output 2 NC		Default configured as (FWRE) Fault Warning Routing Equipment. Potential free change-over contact. Non-monitored. Max.30VDC/1 A	(non-energized)	
25	Detection Loop1 out +		For connection of Max 127 detectors/ loop units		25 +
26	Detection Loop1 out -				26 −
27	Detection Loop1 in +				27 +
28	Detection Loop1 in -				28 −
29	Detection Loop2 out +		For connection of Max 127 detectors/ loop units		29 +
30	Detection Loop2 out -				30 −
31	Detection Loop2 in +				31 +
32	Detection Loop2 in -				32 −

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 36

9.9.2 Ethernet RJ45 connector J2
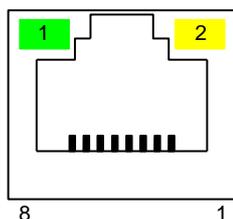
J2-	Description
1	TX+, Transmit Data+
2	TX-, Transmit Data-
3	TX+, Transmit Data+
4	N.C.
5	N.C.
6	TX-, Transmit Data-
7	N.C.
8	N.C.

LED 1	Link/Activity LED
LED 2	If ON, 100MBit/s, if OFF, 10MBit/s

9.9.3 Power Supply Control and Battery Temperature Measurement J3

J3-	Description
1	Vcon 1
2	-V 2
3	PSF 3
4	Thermistor
5	Thermistor

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 37

9.9.4 Auxiliary Terminal Block J4

The auxiliary spring-loaded connection block J4 is capable of cables up to 0,5mm^2 single or multi stranded cables. If multi stranded cables are used, cable crimps should be used.

J4-	Description	
1	O.P. +24V 1	
2	O.P. 0V 1	
3	O.P. A 1	
4	O.P. B 1	
5	O.P. +24V 2	
6	O.P. 0V 2	
7		Connections to Operator Panel (Return/Input for redundancy)
8	O.P. B 2	
9	Panel Bus in A	Connections to panel bus. Connects from unit to unit. (Return/Input for redundancy)
10	Panel Bus in B	
11	Panel Bus Out A	
12	Panel Bus Out B	

9.9.5 Add-on Network Interface, J5

J5-	Description
1	External network interface reset
2	To RX on network card, RS232 level
3	To TX on network card, RS232 level
4	Vbatt
5	Protective 0V
6	+24.0V
7	Reset to external loopers
8	+5.0V
9	To TX on external loopers, TTL level RS232
10	Connector key
11	To RX on external loopers, TTL level RS232
12	0V
13	Protective 0V
14	0V

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 38

9.9.6 Auxiliary Terminal Block J6

J6-	Description		Internal	External
1	RS-232 TX	External Interface Optional data lines		
2	RS-232 RX			
3	RS-232/422/485 0V			
4	RS-422/485 A			
5	RS-422/485 B			
6	RS-422/485 Z			
7	RS-422/485 X			
8	Non-monitored Input 1 +	User configurable input Activates on closing contacts between 24VDC and 0V. Observe polarity		
9	Non-monitored Input 1 -			
10	Non-monitored Input 2 +	User configurable input Activates at application of 24VDC. Observe polarity		
11	Non-monitored Input 2 -			
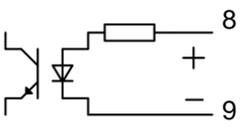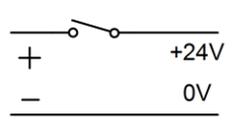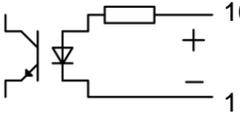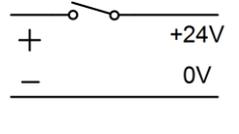
9.9.7 Operator Panel, Standalone, J7

J7-	Description
1	Operator Panel Output +24V
2	Operator Panel Output 0V
3	Operator Panel Output A
4	Operator Panel Output B

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 39
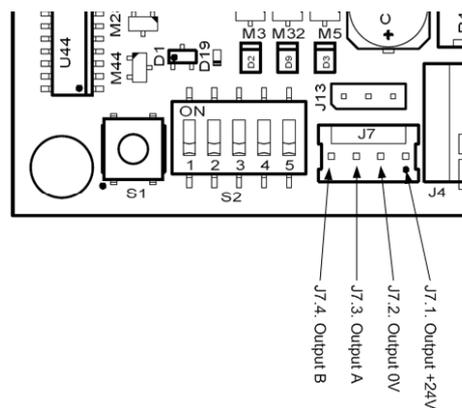
9.9.8 Add-on Looper Interface J8

J8-	Description
1	Not connected
2	Not connected
3	Not connected
4	Not connected
5	Protective 0V
6	+24.0V
7	Reset to external loopers
8	+5.0V
9	To TX on external loopers, TTL level RS232
10	Connector key
11	To RX on external loopers, TTL level RS232
12	0V
13	Protective 0V
14	0V

9.9.9 USB Host J10
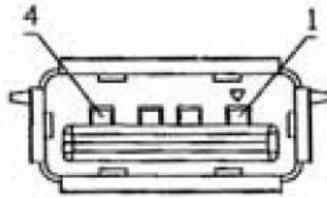
USB host connector, mates with USB type A connector.

J10-	Description
1	+5V
2	Data 1 +
3	Data 1 -
4	0V

9.9.10 User Configurable Inputs

User configurable inputs can be used for
- Day/Night input
- User Configurable input
- Morse input
- Mute Fire Alarm Device (FAD) input
- Reset in
- Silence in
- Fire Alarm Routing Equipment (FARE) feedback (signal from fire brigade)
- Activate all alarms
- Monitored Fault Warning Routing Equipment, FWRE

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 40

9.9.11 User Configurable Outputs

User configurable outputs can be used for
- User Configured output (or General output)
- Reset Out
- Silence Out
- Disable Out
- Silent Alarm Out
- Small Alarm Out
- Fire Alarm Device, FAD
- Fire Alarm Routing Equipment, FARE
- Fault Warning Routing Equipment, FWRE

9.10 Cable Connections inside the Cabinet (Fire Alarm Control Panel)

CAUTION

⚠️

Do <u>not</u> connect the 24V wire to the terminal points used for communication (A and B terminals). This will lead to malfunction of the communication circuits.

9.10.1 Connections (J7) for a standalone cabinet with integrated BS-210

Delivered from the factory, the cables from the integrated operator panel (BS-210) in a standalone cabinet are connected to connector J7.

As the operator panel BS-210 is integrated in a standalone cabinet, redundancy is not required.

| Note:
From the factory, the default configuration of the panel connection (Service Menu/System Settings/"Set Operator Panel connection") is set to "J7, Operator Panel" (connector |
| --- |

Standalone cabinet, with integrated BS-210

BS-210	BSA-200A
J14.1. 24VIN1	J7.1. Output +24V
J14.2. 0VIN1	J7.2. Output 0V
J14.3. 24VIN2	
J14.4. 0VIN2	
J14.5. A_1	J7.3. Output A
J14.6. B_1	J7.4. Output B
J14.7. GND	

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 41
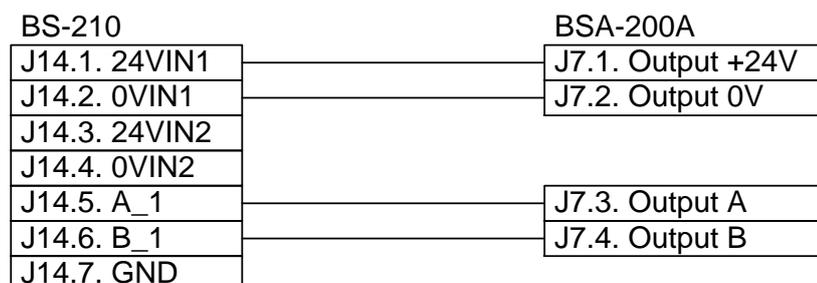
9.10.2 Connections (J4) for a cabinet with external BS-210 and no external panel bus

If the Operator Panel BS-210 is to be placed outside a cabinet, and no external panel bus (with additional panels) is to be connected to the cabinet, the Auxiliary terminal connector J4 must be used.

> Note:
> From the factory, the configuration is by default prepared for a standalone panel with integrated BS-210.
>
> *If the Operator Panel BS-210 is to be placed outside the cabinet and no external panel bus is to be connected to the cabinet,* the configuration of the panel has to be changed during commissioning in order to achieve redundancy and fault monitoring of the panel bus.
>
> Configuration change:
> The configuration of the panel connection (Service Menu/System Settings/"Set Operator Panel connection") must be set to "J4, Auxiliary terminal block" (connector J4) during commissioning/reconfiguration.

Cabinet with external BS-210, no external panel bus

BS-210	BSA-200A
J14.1. 24VIN1	J4.1. O.P. +24V 1
J14.2. 0VIN1	J4.2. O.P. 0V 1
J14.3. 24VIN2	
J14.4. 0VIN2	
J14.5. A_1	J4.3. O.P. A 1
J14.6. B_1	J4.4. O.P. B 1
J14.7. GND	
J13.1. 24VIN1	
J13.2. 0VIN1	
J13.3. 24VIN2	J4.5. O.P. +24V 2
J13.4. 0VIN2	J4.6. O.P. 0V 2
	J4.7. O.P. A 2
	J4.8. O.P. B 2
	J4.9. Panel Bus In A
	J4.10. Panel Bus In B
J13.5. A_2	J4.11. Panel Bus Out A
J13.6. B_2	J4.12. Panel Bus Out B
J14.7. GND	

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 42

9.10.3 Connections (J4) for a cabinet with integrated BS-210 and external panel bus

If the cabinet has an integrated operator panel BS-210 and an external panel bus (with additional panels) is to be connected to the cabinet, the Auxiliary terminal connector J4 must be used.

> Note:
> From the factory, the configuration is by default prepared for a standalone panel with integrated BS-210.
>
> *If the cabinet has an integrated BS-210 and an external panel bus* is to be connected to the cabinet, the configuration of the panel has to be changed during commissioning in order to achieve redundancy and fault monitoring of the panel bus.
>
> Configuration change for panels on a panel bus:
> The configuration of the panel connection (Service Menu/System Settings/"Set Operator Panel connection") must be set to "J4, Auxiliary terminal block" (connector J4) during commissioning/reconfiguration.

Cabinet with integrated BS-210, external panel bus

BS-210

	BSA-200A
J14.1. 24VIN1	J7.1. Output +24V
J14.2. 0VIN1	J7.2. Output 0V
J14.3. 24VIN2	
J14.4. 0VIN2	
J14.5. A_1	J7.3. Output A
J14.6. B_1	J7.4. Output B
J14.7. GND	

	J4.1. O.P. +24V 1
	J4.2. O.P. 0V 1
J13.1. 24VIN1	J4.3. O.P. A 1
J13.2. 0VIN1	J4.4. O.P. B 1
J13.3. 24VIN2	J4.5. O.P. +24V 2
J13.4. 0VIN2	J4.6. O.P. 0V 2
J13.5. A_2	J4.7. O.P. A 2
J13.6. B_2	J4.8. O.P. B 2
J14.7. GND	J4.9. Panel Bus In A
	J4.10. Panel Bus In B
To external panels	J4.11. Panel Bus Out A
	J4.12. Panel Bus Out B

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 43

9.10.4 Connections (J4) for a cabinet with external BS-210 and external panel bus

If the Operator Panel BS-210 is to be placed outside a cabinet and an external panel bus (with additional panels) is to be connected to the cabinet, the Auxiliary terminal connector J4 must be used.

Note:
From the factory, the configuration is by default prepared for a standalone panel with integrated BS-210.

If the Operator Panel BS-210 is to be placed outside the cabinet and an external panel bus is to be connected to the cabinet, the configuration of the panel has to be changed during commissioning in order to achieve redundancy and fault monitoring of the panel bus.

Configuration change for panels on a panel bus:
The configuration of the panel connection (Service Menu/System Settings/"Set Operator Panel connection") must be set to "J4, Auxiliary terminal block" (connector J4) during commissioning/reconfiguration.

Cabinet with external BS-210, external panel bus

BS-210	BSA-200A
J14.1. 24VIN1	J4.1. O.P.+24V 1
J14.2. 0VIN1	J4.2. O.P. 0V 1
J14.3. 24VIN2	
J14.4. 0VIN2	
J14.5. A_1	J4.3. O.P. A 1
J14.6. B_1	J4.4. O.P. B 1
J14.7. GND	

BS-210	BSA-200A
J13.1. 24VIN1	
J13.2. 0VIN1	
J13.3. 24VIN2	J4.5. O.P. +24V 2
J13.4. 0VIN2	J4.6. O.P. 0V 2
J13.5. A_2	J4.7. O.P. A 2
J13.6. B_2	J4.8. O.P. B 2
J14.7. GND	J4.9. Panel Bus In A
	J4.10. Panel Bus In B
	J4.11. Panel Bus Out A
	J4.12. Panel Bus Out B

To external panels

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Page 44

9.11 Panel Bus Connections to BU-, BV- and BS-panels

CAUTION

⚠

> Do not connect the 24V wire to the terminal points used for communication (A and B terminals). This will lead to malfunction of the communication circuits.

Note that when connecting additional panels on a panel bus, the communication cables inside the cabinet (Fire Alarm Control Panel) must be connected as shown in chapter 9.10.2.

If additional panels are to be connected to the RS-485 Panel Bus, the additional panel's Panel Bus connector J13 and J14 is used. This connector is located on the rear side of the BU-, BV- and BS-panels.

Panel Bus connector on additional panels (viewed from rear side of panel where cables are to be connected)

◯	J14							J13						
	24ViN1	0V iN 1	24ViN2	0v iN 2	A1_1	B1_1	GND	24ViN1	0V iN 1	24ViN2	0v iN 2	A2_2	B2_2	GND
	Panel Bus In							**Panel Bus Out**						

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Page 45

9.12 Overview Panel Bus

CAUTION

Do not connect the 24V wire to the terminal points used for communication (A and B terminals). This will lead to malfunction of the communication circuits.

The termination point "GND" is available for termination of the shield from a shielded cable. In this way, it is possible to establish a through-connected shielded cable. Note that it is not required to terminate this point to an Earth connection.

Connection of panels on the Panel Bus

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Autronica Fire and Security AS

Page 46

9.13 Connections to Mimic Drivers (BUR-200)

NOTE: For specific information on the installation and cable connections for *maritime* installations, refer to chapter 10.

The BUR-200 is a Mimic Driver that is capable of driving 32 LEDs with series resistors on a mimic panel for additional indication of alarms. In addition, 8 standard monitored inputs can be used for reading various switches.

Power redundancy is achieved by using a daisy-chain connection with master and slave drivers. A maximum of 8 Mimic Drivers can be connected to the panel bus, providing a total of 256 outputs and 64 monitored inputs.

Note that when connecting additional panels on a panel bus, the communication cables inside the cabinet (Fire Alarm Control Panel) must be connected as shown in chapter 9.11.

CAUTION

Do <u>not</u> connect the 24V wire to the terminal points used for communication (A and B terminals). This will lead to malfunction of the communication circuits.

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Page 47

9.13.1 Terminal Points – Overview

E-2739

7	6	5	4	3	2	1		7	6	5	4	3	2	1
Inst. Gnd	B2	A2	0V 24V- 2	+	0V 24V- 1	+		Inst. Gnd	B1	A1	0V 24V- 2	+	0V 24V- 1	+

BU/BV Mimic Panel Bus IN J5   BU/BV Mimic Panel Bus OUT J4

BUR-200
MIMIC
DRIVER

J19
Outp.1	8
Outp.2	7
Outp.3	6
Outp.4	5
Outp.5	4
Outp.6	3
Outp.7	2
Outp.8	1

J23
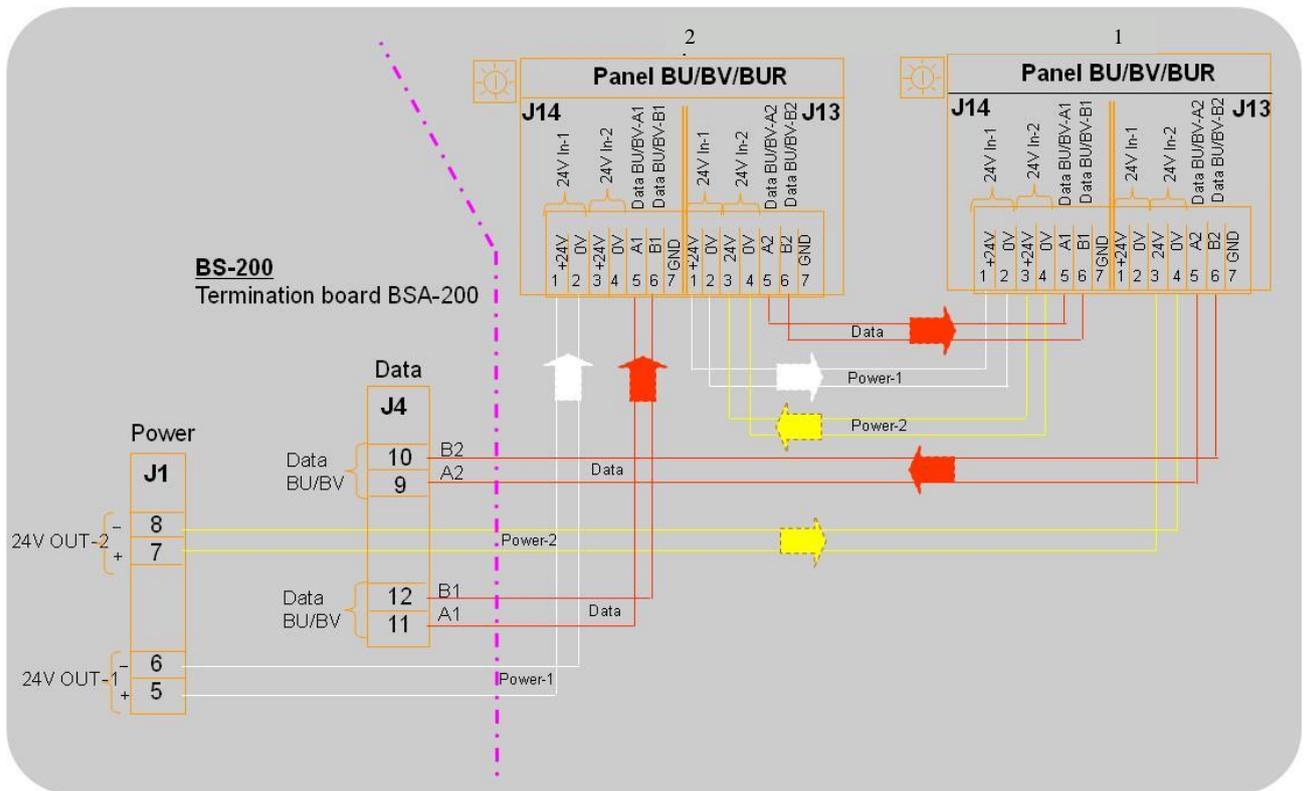| +24V | 8 |
+24V	7
+24V	6
+24V	5
+24V	4
+24V	3
+24V	2
+24V	1

J18
Outp. 9	8
Outp.10	7
Outp.11	6
Outp.12	5
Outp.13	4
Outp.14	3
Outp.15	2
Outp.16	1

J22
+24V	8
+24V	7
+24V	6
+24V	5
+24V	4
+24V	3
+24V	2
+24V	1

J17
Outp.17	8
Outp.18	7
Outp.19	6
Outp.20	5
Outp.21	4
Outp.22	3
Outp.23	2
Outp.24	1

J21
+24V	8
+24V	7
+24V	6
+24V	5
+24V	4
+24V	3
+24V	2
+24V	1

J16
Outp.25	8
Outp.26	7
Outp.27	6
Outp.28	5
Outp.29	4
Outp.30	3
Outp.31	2
Outp.32	1

J20
+24V	8
+24V	7
+24V	6
+24V	5
+24V	4
+24V	3
+24V	2
+24V	1

RESET

J15
| Pwr. LED+24V | 6 |
| Pwr. LED out | 5 |

J12
	7
See manual	6
	5
	4
	3
	2
	1

J12

X2
Adress Switch

J13
Inp.4 -	8
Inp.4 +	7
Inp.3 -	6
Inp.3 +	5
Inp.2 -	4
Inp.2 +	3
Inp.1 -	2
Inp.1 +	1

J14
Inp.8 -	8
Inp.8 +	7
Inp.7 -	6
Inp.7 +	5
Inp.6 -	4
Inp.6 +	3
Inp.5 -	2
Inp.5 +	1

S2-RS 485 Mode Switch
See manual

Switch S2
Mode switch

J2
Out 1		Out 2		RS- 485				Inst.
+24V	0V	+24V	0V	A3	B3	A4	B4	Gnd.
1	2	3	4	5	6	7	8	9

With external power without fault output: mount a strap between terminals 1 and 2 on connector J12

Without external power: mount a strap between terminals 1 and 2 on connector J12

When OK: K1 is closed (between J12.1 and J12.2)
When fault: K1 is open (between J12.1 and J12.2)

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Autronica Fire and Security AS

Page 48

9.13.2 Switch Settings

RS-485 termination and board mode switch.

Switch	Description
S2.1	RS-485 3 Failsafe termination
S2.2	(see description below)
S2.3	RS-485 3 Line termination
S2.7	BUR-200 Master/Slave select (ON: Master, OFF: Slave)
S2.8	Toggle function: impedance versus light intensity.

Switch Settings Failsafe and Line Termination

Master and the *last** Slave: The switches S2.1, S2.2 and S2.3 are to be set to ON.

Other Slaves: The switches S2.1, S2.2 and S2.3 are to be set to OFF.
*Refer to the next chapter: Connection of Master and Slave Mimic Drivers.

X2 Panel Bus Address Switch
If S2.7 is set to Master, X2 sets the panel bus address. If S2.7 is set as slave, X2 sets the RS-485 daisy-chain slave address. The range for the switch is 1-9.

9.13.3 Connection of Master and Slave Mimic Drivers

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Autronica Fire and Security AS

Page 49
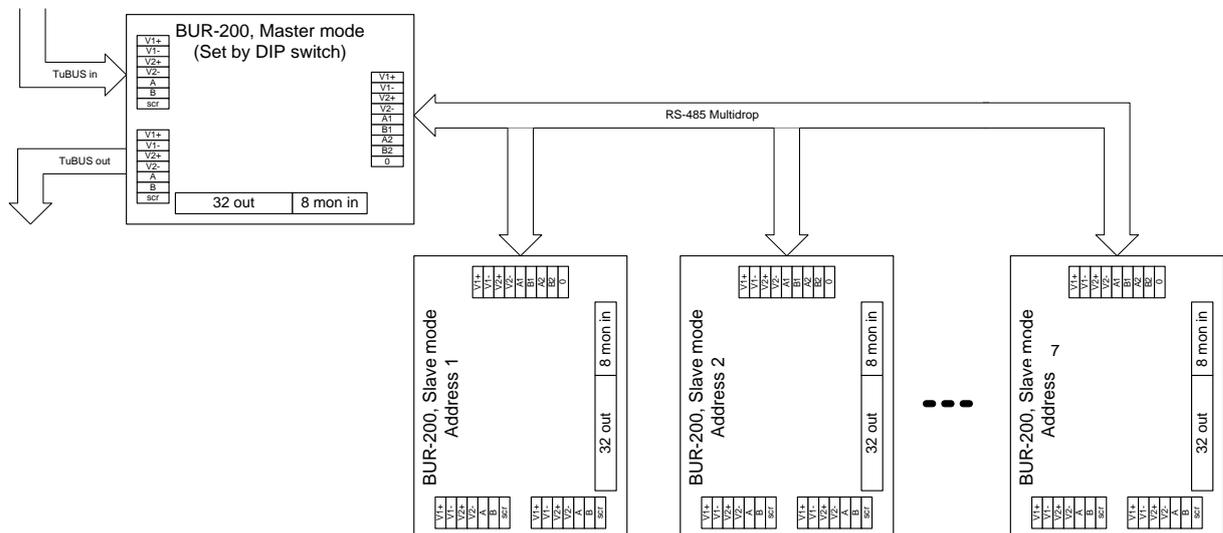
9.13.4 Connections for Panel Bus

7	6	5	4	3	2	1		7	6	5	4	3	2	1
Inst Gnd	B2	A2	0V	+	0V	+		Inst Gnd	B1	A1	0V	+	0V	+
			24V- 2		24V- 1						24V- 2		24V- 1	
BU/BV Mimic Panel Bus IN J5								BU/BV Mimic Panel Bus OUT J4						

9.13.5 Connections for Slave Panels
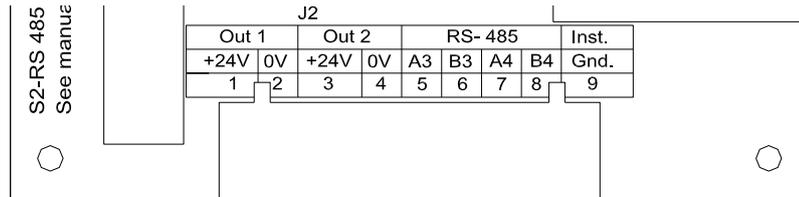
9.13.6 Terminals for monitored inputs

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Page 50
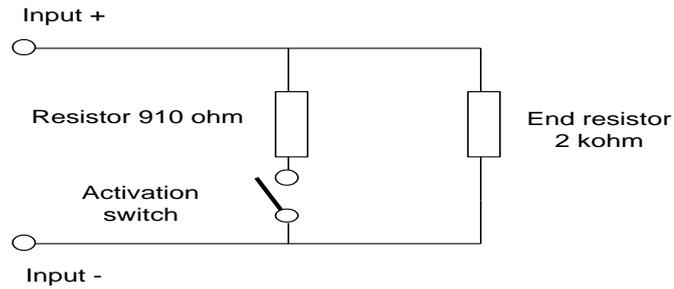
9.14 Ground Fault

A)Normal situation, there shall be approximately 12VDC
between GND and 0V.

Fault scenarios:
B) Ground fault to +24V, if there is less than 50kohm between GND
and +24V.
C) Ground fault to 0V, if there is less than 50kohm between GND
and 0V.

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Autronica Fire and Security AS

Page 51
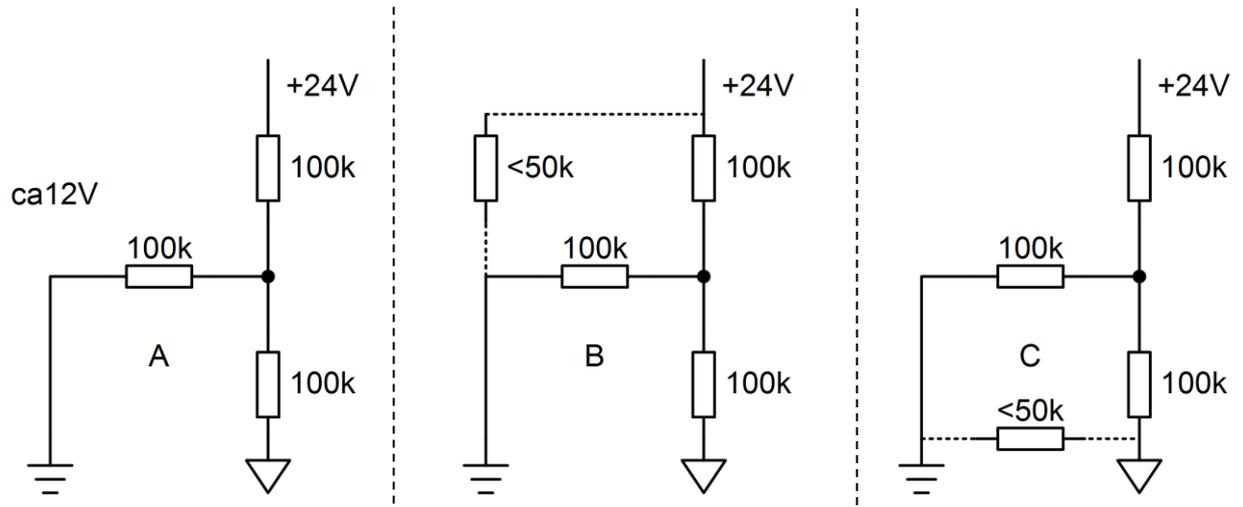
10. Maritime Installations

10.1 Typical Maritime Installation – Overview

The overview below shows an example of a typical system layout for a maritime installation.

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Autronica Fire and Security AS

Page 52
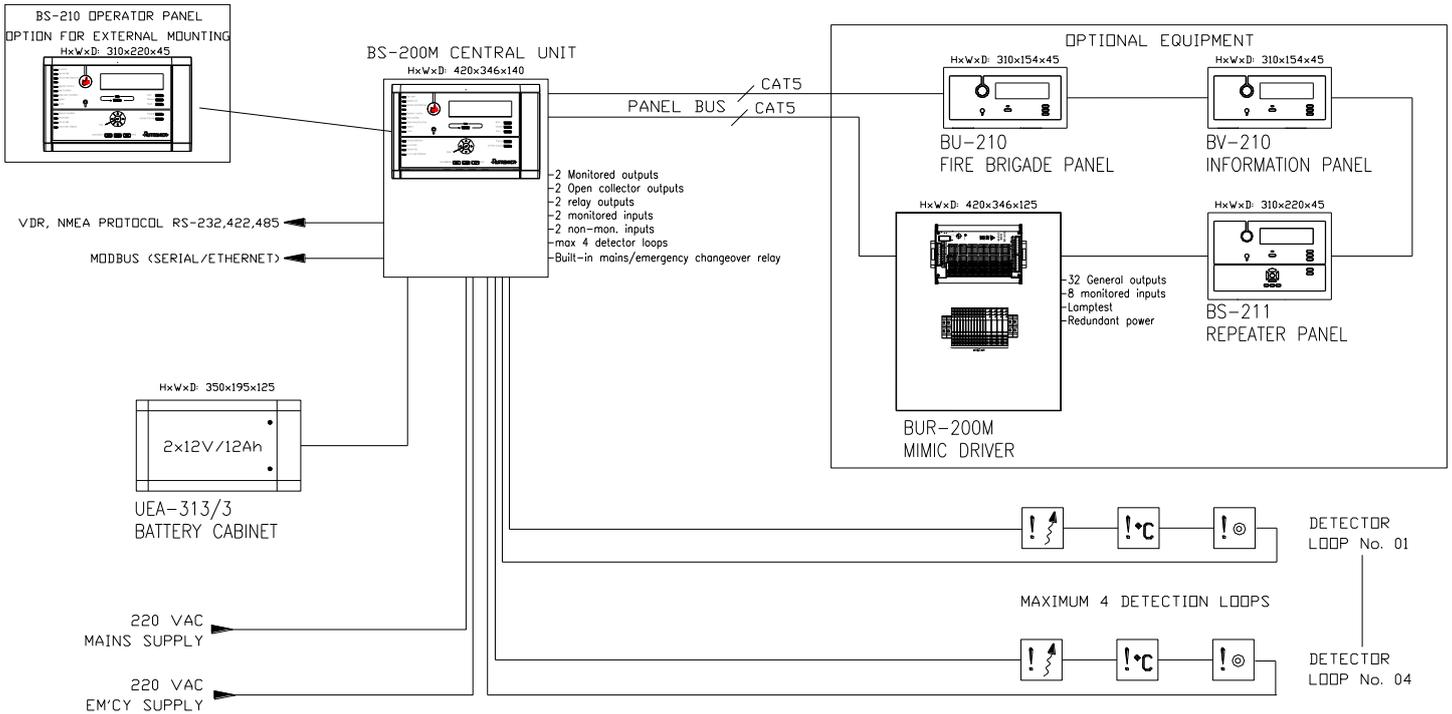
10.2 Fire Alarm Control Panel BS-200M

The BS-200M is specifically designed for use in maritime applications. The panel is provided with a filter.

10.2.1 External Connections

116-71211549 (230VAC) and
116-71211550 (110VAC)

X1

X1	Description
1	Mains 110/230 VAC
2	Mains 110/230 VAC
3	Emergency 110/230 VAC
4	Emergency 110/230 VAC
5	Earth
K15	Change-over Relay
K16	Mains Fault
K17	Emergency Fault

X2

X2	Description
1	External 24V +
2	External 24V -
3	Battery 24V +
4	Battery 24V -

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Page 53

10.2.2 Detection Loop Connections – Extended Terminal Block
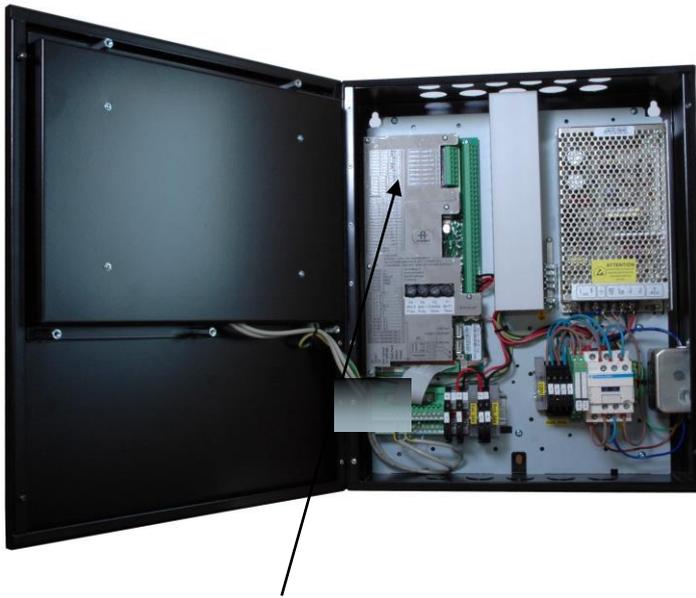
1	Detection Loop 3 out +	For connection of Max 127 detectors/ loop units		1 + 2 − 3 + 4 −
2	Detection Loop 3 out -			
3	Detection Loop 3 in +			
4	Detection Loop 3 in -			
5	Detection Loop 4 out +	For connection of Max 127 detectors/ loop units		5 + 6 − 7 + 8 −
6	Detection Loop 4 out -			
7	Detection Loop 4 in +			
8	Detection Loop 4 in -			

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Page 54

10.2.3 Internal Wiring

The drawings in this chapter shows the internal wiring of the Fire Alarm Control Panel BS-200M (cabinet) for the following alternatives:

- Cabinet with external BS-210 and no external panel bus
- Cabinet with external BS-210 and an external panel bus
- Cabinet with integrated BS-210 with or without external panel bus – with mains changeover relay
- Cabinet with integrated BS-210 with or without external panel bus - without mains changeover relay

The following description applies to all alternatives:
K16 and K17 are connected to non-monitored input 1 and 2 on X3 for mains/energy fault indication. Inputs have to be configured to show the correct fault text on the panel. If the power fault indication is needed on external systems, 2 dedicated outputs can be configured to be activated by non-monitored input 1 and 2 for external power fault indication.

10.2.3.1 Cabinet with external BS-210 and no external panel bus

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Page 55

10.2.3.2 Cabinet with external BS-210 and external panel bus

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Page 56

10.2.3.3 Cabinet with integrated BS-210 with/without external panel bus – with mains changeover relay

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Page 57

10.2.3.4 Cabinet with integrated BS-210 with/without external panel bus – without mains changeover relay

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Page 58

10.3 Panel Bus Connection

The drawing below shows an example of a panel bus
interconnecting a Fire Alarm Control Panel BS-200M, a Repeater
Panel BS-211, an Information Panel BV-210 and a BUR-200 Mimic
Driver.

Note that connections depend on the number of panels on the
Panel
Bus.
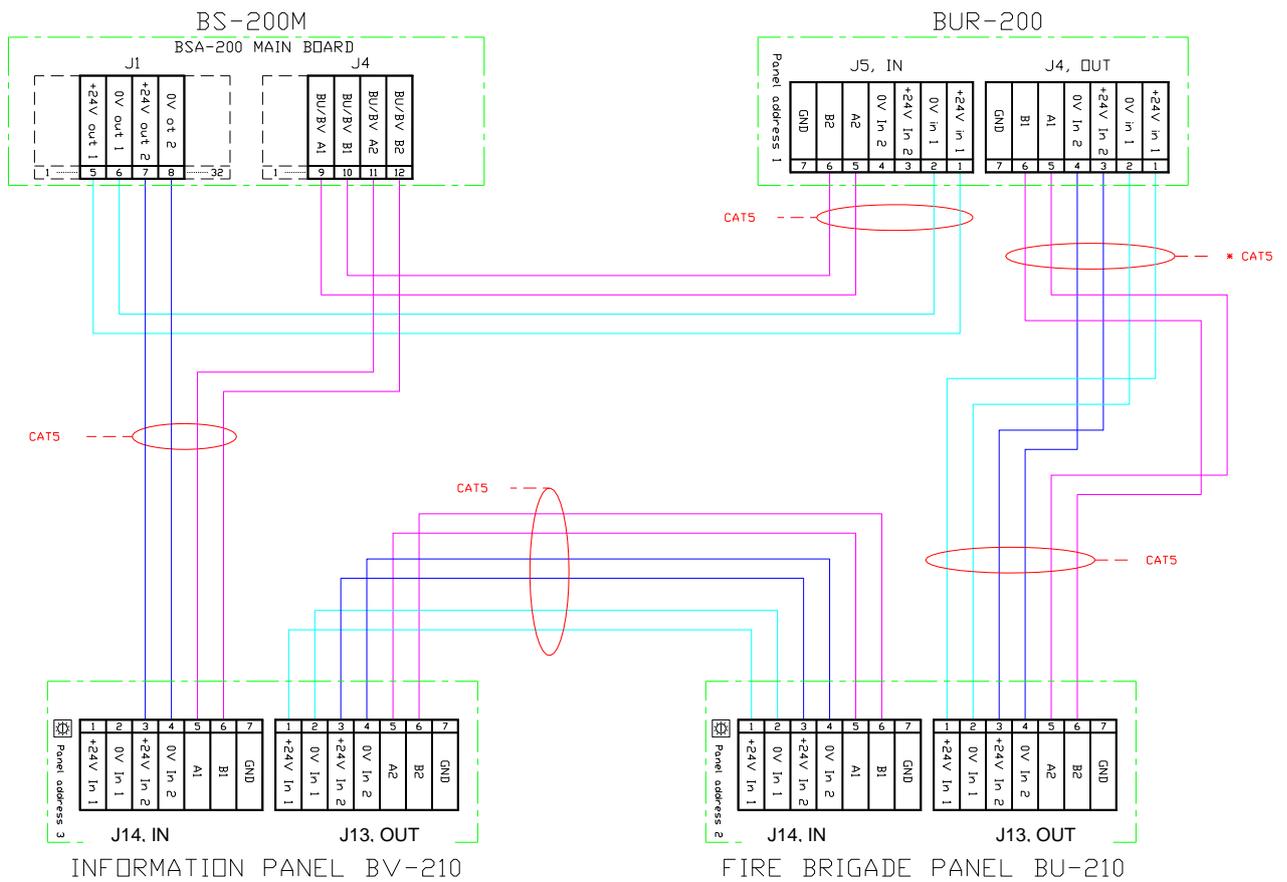
	J14							J13						
	24ViN1	0V iN 1	24ViN2	0v iN 2	A1_1	B1_1	GND	24ViN1	0V iN 1	24ViN2	0v iN 2	A2_2	B2_2	GND
				Panel Bus In							Panel Bus Out			

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Page 59

10.4 Mimic Cabinet BUR-200

The Mimic Cabinet BUR-200 is specifically designed for use in maritime applications. It includes 1 Mimic Driver BUR-200 and 16 programmable relays.
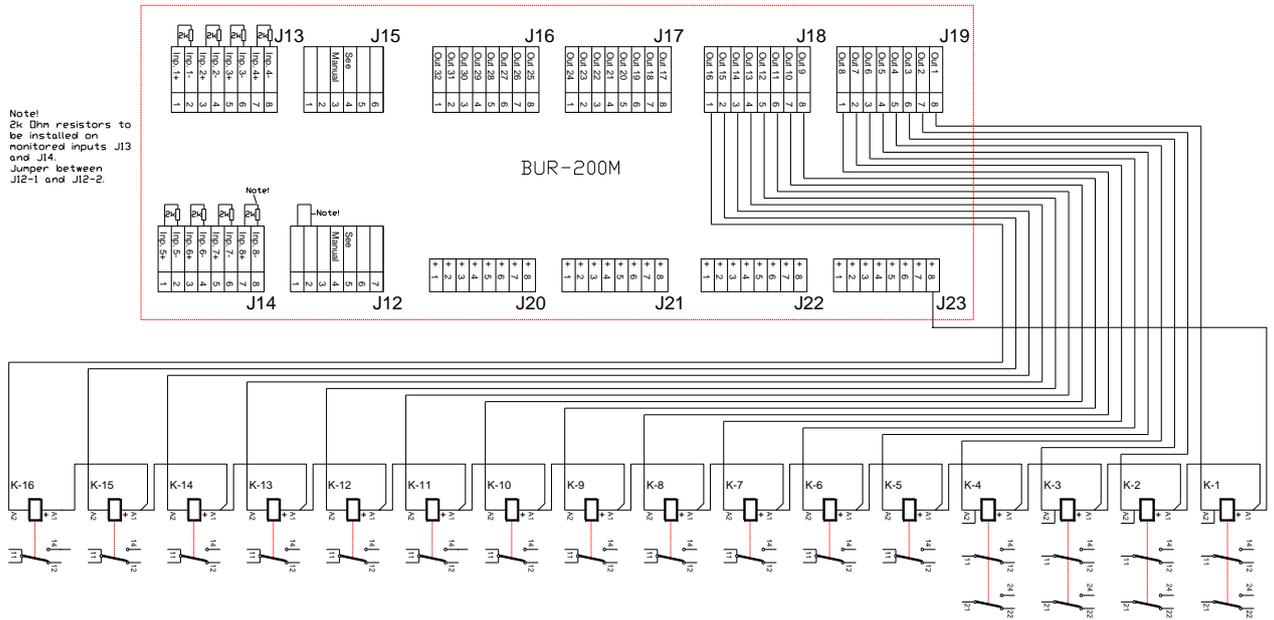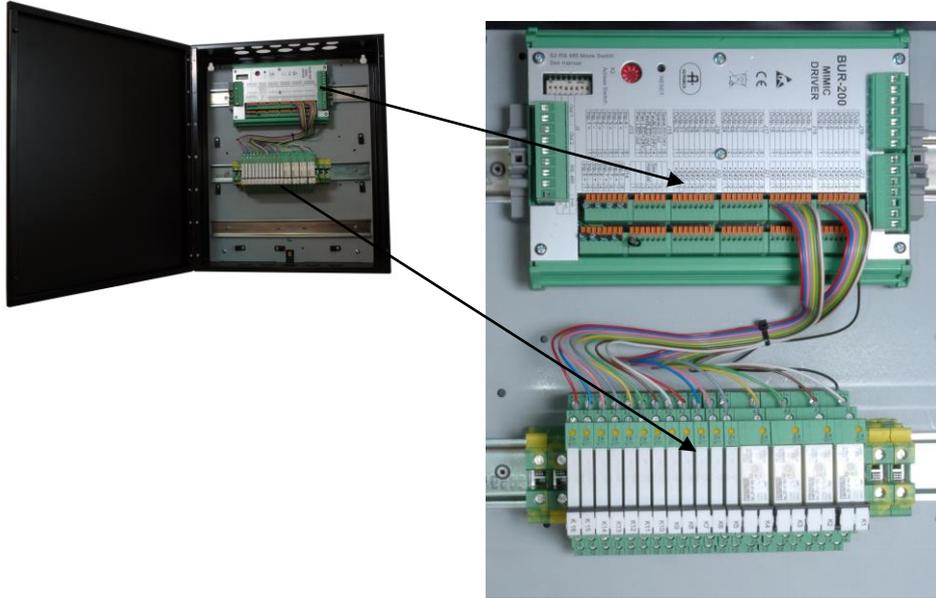
Note:
2k Ohm resistors must be installed on the monitored inputs J13 and J14. A jumper must be installed between J12-1 and J12-2.

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Page 60

10.5 External Battery Cabinet

Part number	Description
116-234403	Battery Cab. 1x24 DC 12Ah CS

10.5.1 Dimensions

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Page 61
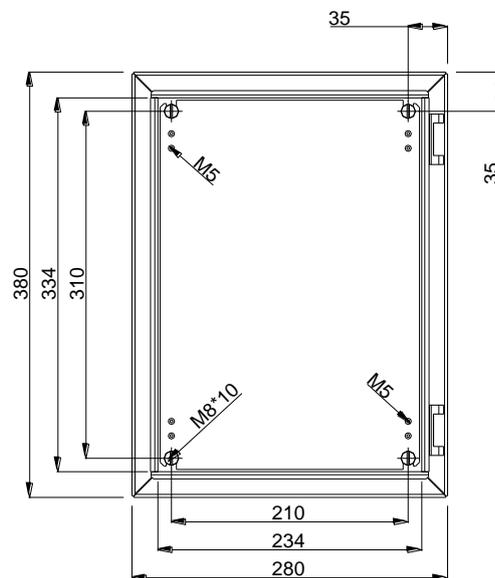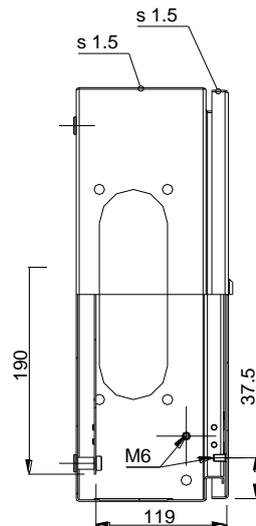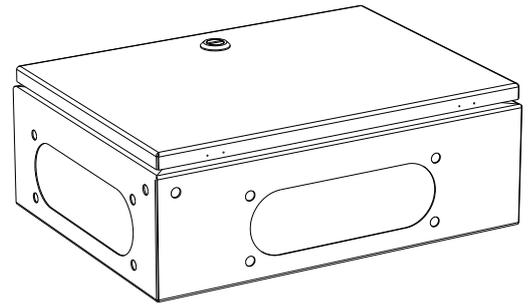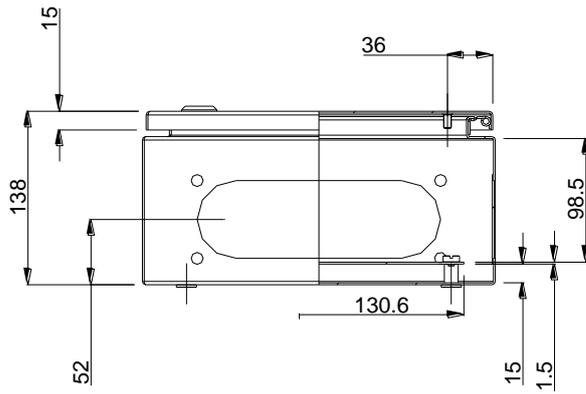
10.5.2 Internal Connections in Battery Cabinet

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Page 62
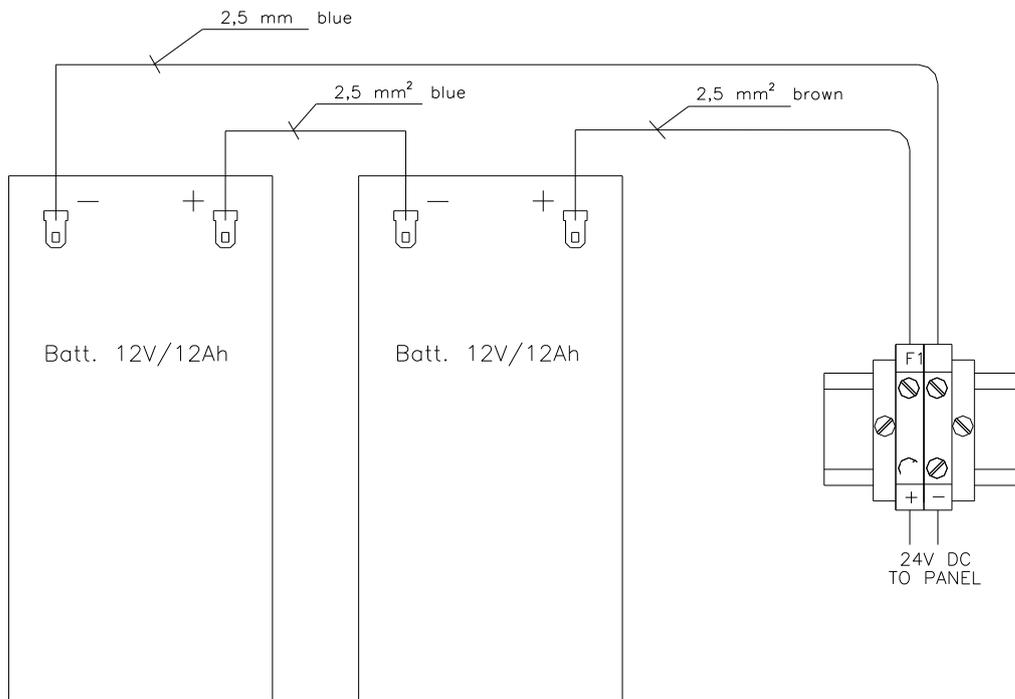
11. Startup

11.1 Power Up

Autroprime is provided to the user in a pre-configured state. In this state the panel is set to recognize detectors and other loop units connected to the detection loops and the availability of routing equipment, etc. As such, the system is fully functional and ready-to-use simply by turning ON the power and following the simple steps below.

When the necessary cabling for the Fire Alarm Control Panel and all other panels that are to be interconnected is completed, you are ready to power up the Fire Alarm Control Panel.

- To turn ON the Fire Alarm Control Panel, connect the mains cable, then connect the internal battery cables to the correct terminal points. Refer to *Cable Connections*, chapter 9.

The green Power-indicator lights up with a steady green light, and an initialization starts.

Step	Display Indication / What happens?	Actions to be taken
1	The panel type, firmware version and address are shown in the display. A pulsing cursor starts to move from left to right on the bottom line of the display, indicating the progress of the initialization procedure. The length of the initialization period depends on the number and types of loop units, and whether there are branches on the loops. After a short time, the system will prompt you to select the appropriate language.	• To select the appropriate language, press the Enter button, then use the left/right arrow buttons. • To accept the selected language, press the Enter button twice.
2	The system will then prompt you to enter a password.	• Press Enter, use the alphanumeric keypad to type the password and then type it once more to confirm the password.
3	The system will prompt you to set the date and time.	• Press Enter, use the alphanumeric keypad to set the time, press the Enter button, then set the date. • To accept, press the Enter button twice.
4	When the initialization procedure is completed, the panel will recognize detectors and other loop units and the system topology is shown in the display. A functional verification of the panel is run to assure the panel itself is fully functional.	• Verify that the topology is correct according to the actual installation.

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Page 63

Step	Actions to be taken
5	• Turn the key clockwise. • To enter Service Mode, press and hold down the Enter button for a few seconds. • Use the Arrow down button to select Service, then press Enter. • Select System Settings (the uppermost menu selection which is highlighted), then press Enter. • Select **Save Configuration** (the uppermost menu selection which is highlighted), then press Enter twice. • Type the Operator Name, then press Enter. • Type the Site Configuration Version, then press Enter. • Type a Description, then press Enter. • Press Enter once more to confirm. • • Use the Arrow down button to select **Restart System**. • Use the left Arrow button to select Accept, then press Enter. • The message "System is now shutting down…" will appear, and the system will reboot automatically. The system topology is shown in the display. Press the Cancel/Back button to reveal the idle display.
6	Before leaving the system unattended, all faults should be corrected. Any fault preventing the system from detecting or reporting a fire must be corrected.

The system now functions with the default configuration. Site-specific configuration can now be carried out. For details on system configuration and examples on how to configure a site-specific configuration, refer to the Configuration Handbook.

11.2 Testing

To ensure that the system works properly during normal operation after commissioning, the whole system (control panel, detectors, control functions, activation groups, activation of inputs/outputs) should be verified.

11.3 Safety Measures during Commissioning and Maintenance

NOTE
To avoid unmotivated activation of release outputs on connected safety-critical systems, it is important that service personnel physically disconnects or disables (in the Service Menu) the safety-critical system from the fire detection system during commissioning and maintenance.

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Page 64

11.4 Service Menu when the System is Starting

If a USB-stick is connected when the system is powered on, or HW reset by pressing button S1 on BSA-200A, the Enter button lights up after approx. 35 seconds, and the display writes "Starting Firmware".
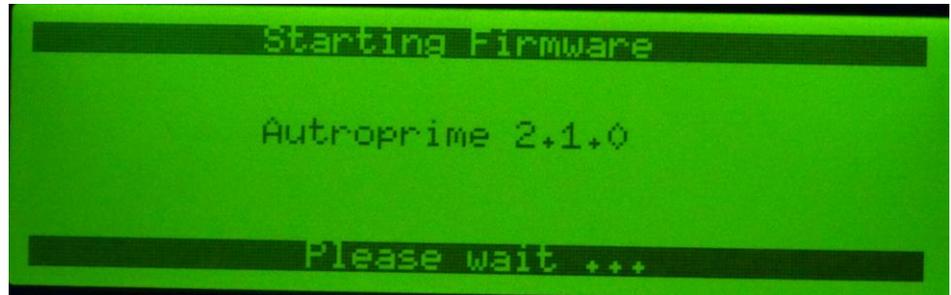
By pressing the Enter button a service menu is shown.

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Page 65

12. Switches and Indicators on the Main Board

12.1 Overview

*System Fault
LED indicator*   *Status LED
indicator*   *Power LED
indicator*

S1: Reset switch   *S2: Dipswitches
for mode settings*   *S4: Dipswitches
for serial port
settings*

*S3: Battery
Restart switch*
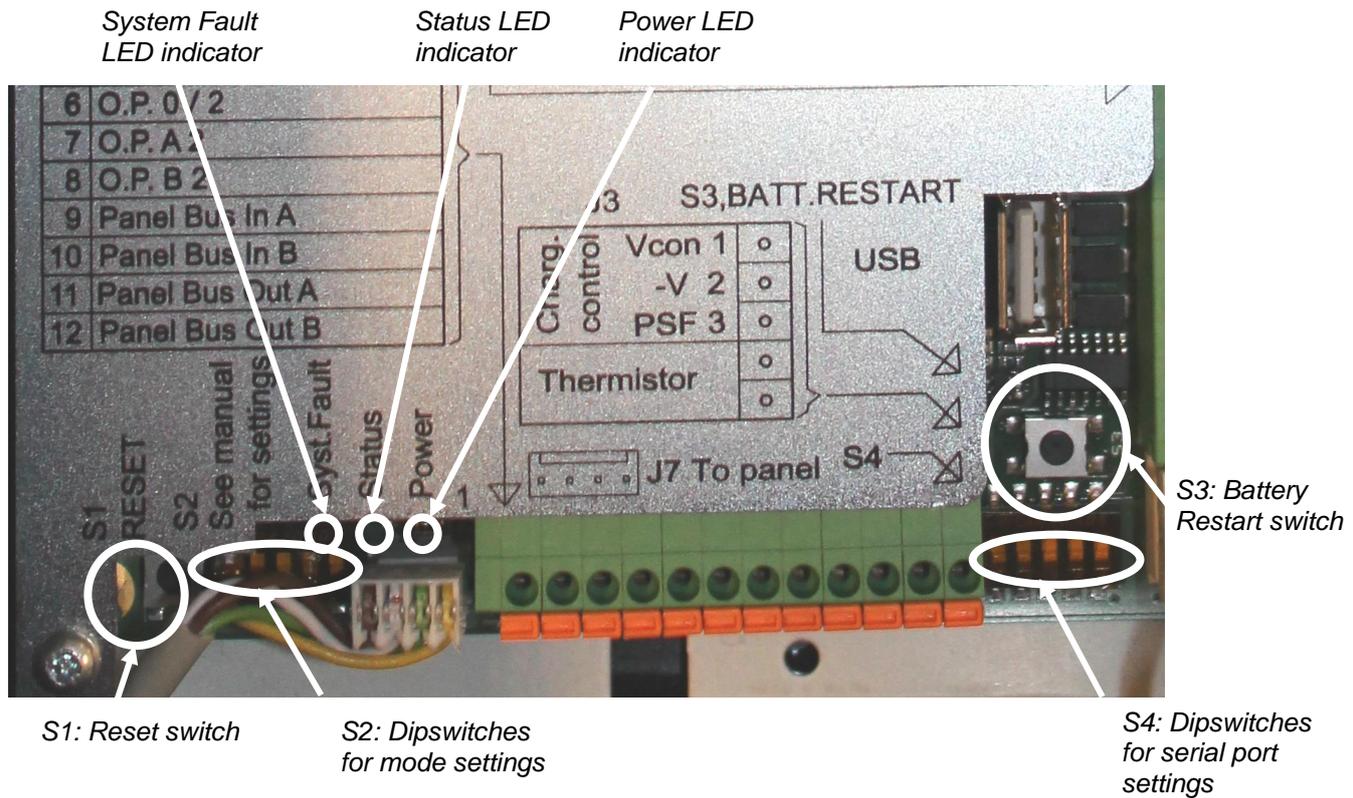
12.2 Reset Switch (S1)

Warning:

The reset switch (S1) on the main board is to be pressed only if the System Fault indicator on the main board for any reason is lit.

(A normal system reset – which is a quite different operation - is done by pressing the green Reset button on the front panel. Also, if a restart of the panel is required , this is to be done via the Menu entry in Service mode.)

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Page 66

12.3 Dip-switches for Mode Settings (S2)

Switch	Description	Default
S2.1	Boot select, if ON, boot from external memory, if OFF boot from internal boot ROM. In normal operation set to On.	ON
S2.2	Not in use.	OFF
S2.3	Run without batteries	OFF
S2.4	Market selection. Select between Land (BS-200) and Maritime (BS/200M) Land: S2.4 ON Maritime: S2.4 OFF	ON
S2.5	ON: disable Deep Discharge function (relay always kept closed). Refer to chapter 12.5.	OFF

12.4 Battery Short-circuit Protection

The battery circuit is protected with an automatic resettable electronic fuse that prevents system shutdown in case of short-circuit in the battery circuit.

Internal Cabling

Connector	Description	Power Supply	
J3.1	Charge Control	VCON	
J3.2	Charge Control FB	-V	
J3.3	Mains OK	PSF	
J3.4	Battery Temperature Sense +		Battery Temperature Sensor
J3.5	Battery Temperature Sense -		
J1.3	Charger +24V	+V	
J1.4	Charger 0V	-V	

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Page 67

12.5 Battery Restart after Deep Discharge (S3)

The Battery Restart switch (S3) is to be pressed only in case you need to commission the panel by means of the batteries (if the mains power is not available). A complete hardware reset will take place.
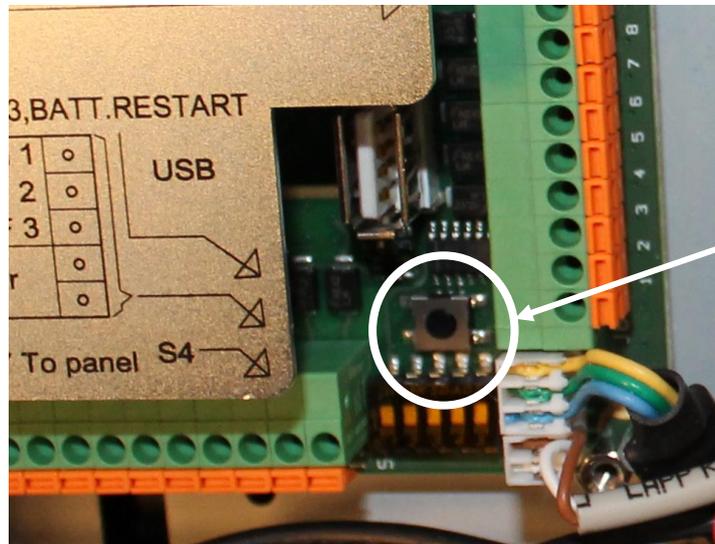
Battery Restart Switch S3

The switch turns on the relay in the battery circuit.
• If the system is run from battery and the battery is replaced, the switch must be operated to restart the system

EN54 part 4 states that if the battery voltage drops below a limit specified by the manufacturer (17V) the battery shall be disconnected to prevent deep discharge. The battery is disconnected using a relay.

*Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS*

Page 68
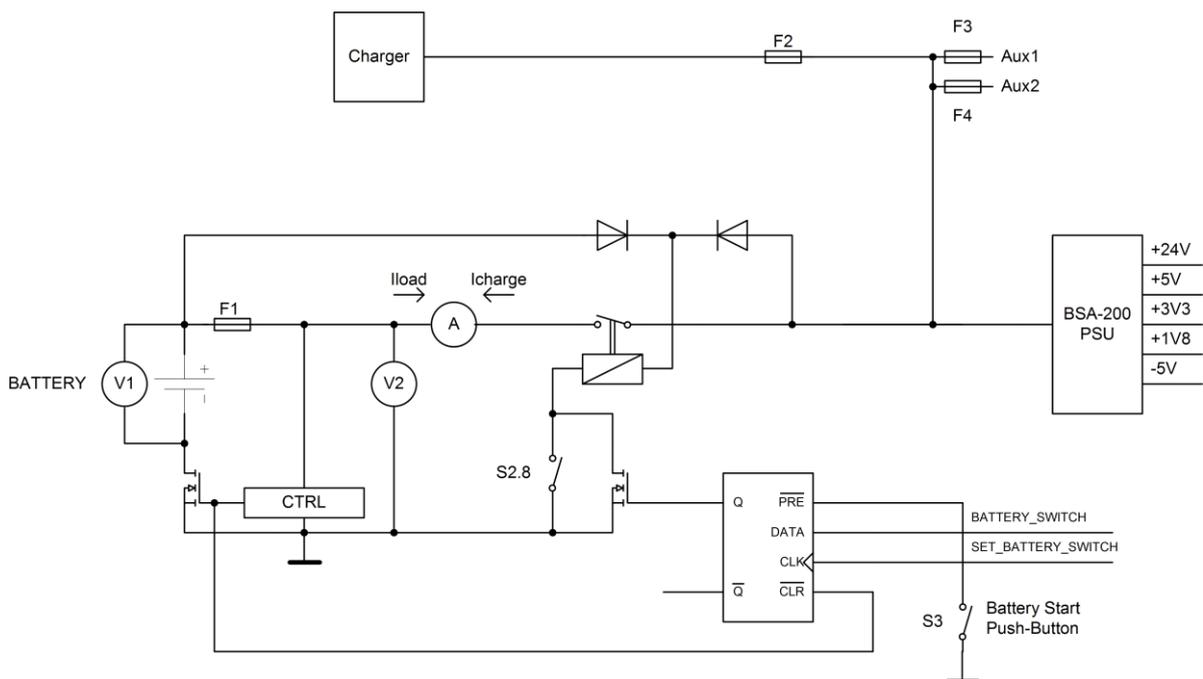
12.6 Serial Port Settings (S4)

Switch	Description
S4.1	Multi purpose serial port RS485/RS422 failsafe termination,
S4.2	ON/OFF
S4.3	Multi purpose serial port RS485/RS422 line termination, ON/OFF
S4.4	RS485/RS422 mode select
S4.5	RS485 mode: both switches ON, RS422 mode: both switches OFF

12.7 System Fault LED indicator (yellow)

The yellow System Fault indicator is lit if a system fault occurs. The board enters this security mode if the main processor fails to function due to hardware problems on the main board, programme faults or faults in the file system. If such a fault occurs, the reset switch (S1) has to be pressed to regain normal operation of the board. If it is not possible to regain normal operation, the board must be replaced.

12.8 Status LED indicator (red)

When the system is being powered up, or a HW reset is performed by pressing button S1 on BSA-200A, the red status indicator is turned on for about 6 seconds, and then switched off.

12.9 Power LED indicator (green)

The green Power LED indicator is lit when the main board is supplied with the correct power (3,3VDC and 5VDC).

12.10 Regulated 24V Indicator (green)

The green LED indicator is lit when the regulated 24V power is OK.

*Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS*

Page 69

13. Exporting / Importing Configuration Data

This product contains static-sensitive devices. Please avoid any electrostatic discharge during these operations.

13.1 USB Output

By means of a USB memory stick, configuration data can be exported or imported.

The USB output J12 is used for this purpose. It is easily accessible from the inside of the front panel door.

Note that the maximum load on the USB port is 100mA.

The USB port is provided with a resettable fuse.
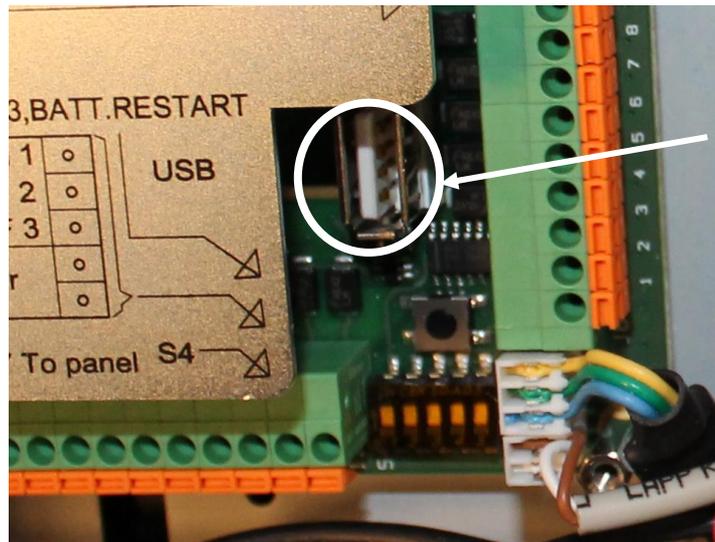
USB output J12

We recommend that the USB-stick that is to be used contains Autronica-related files only.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 70

13.2 Entering the Service Menu

- First, to enter the *Menu Mode* from operation mode or the panel's idle state, press and hold down the Enter button [button icon] for a few seconds.

The following will appear in the display:

```
MENU
System Status
Disable
Enable
Show Unit Properties
Report
Enter Service Mode
    ▲▼:Scroll  ←:Back  ↵:Enter
```
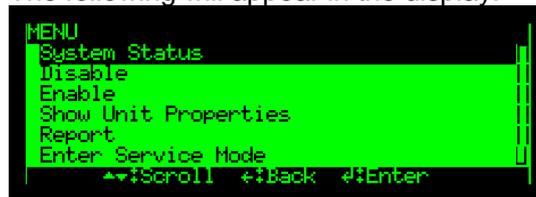
- Use the arrow down button to scroll down and select *Enter Service Mode*.

```
            MENU
System Status
Disable
Enable
Show Unit Properties
Report
Enter Service Mode
    ▲▼:Scroll  ●:Back  ↵:Enter
```

- Press Enter twice, then use the alphanumeric keypad and type the password that has been selected during commissioning (4 characters).

```
        ENTER SERVICE MODE
Type password:
  ■■■■■

            ●:Back  ↵:Enter
```
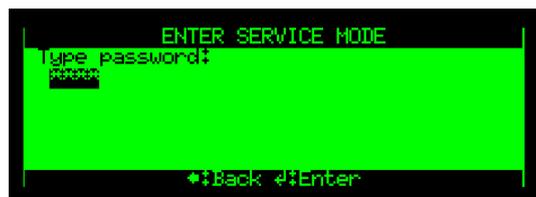
- To accept the password, press Enter once more.

The menu selections *Service* and *Exit Service* now appear in the display.

```
            MENU
Disable
Enable
Show Unit Properties
Report
Service
Exit Service Mode
    ▲▼:Scroll  ●:Back  ↵:Enter
```

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 71
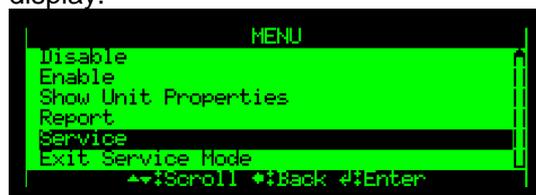
To enter the *Service* menu, use the arrow down button to scroll

down and select *Service*, then press the Enter button ⏎

```
              SERVICE
System Settings
Loop Operation
Unit Configuration
Unit Test
System Topology
Export and Import
     ▲▼:Scroll ◄:Back ◄:Enter
```

13.3 Exporting Configuration Data

- To export configuration data, enter the service menu (see chapter 13.2), select the Export and Import menu, then perform the command Export Configuration.

This command allows you to export configuration files from the system to a USB memory stick.

> **Make sure to save all recent configuration changes (using the Save Configuration command in the System Settings menu, chapter 13.7) before executing the Export Configuration command.**

From the Service Menu, perform the following:
- Use the arrow down button to scroll downwards to Export and Import, then press Enter.
- Press the arrow down button to select Export Configuration, then press Enter.

The following message will appear:
" Copy the last saved configuration file to a USB device."

- To execute the command, use the left arrow button to select Accept, then press Enter.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 72

13.4 Importing Configuration Data

- To import configuration data, enter the service menu (see chapter 13.2), select the Export and Import menu, then perform the command Import Configuration.

> **The imported configuration will have no impact on the running system. To use the imported configuration the system must be restarted (Restart System, chapter 13.6).**

> Note that when importing a configuration from AutroClient, all configurations saved by AutroClient 1.0.4 or previous versions will be rejected by Autroprime.
> Open the configuration in AutroClient 1.0.5 (or newer) and save to Config.xml before importing into Autroprime.

This command allows you to import configuration files from a USB memory stick.

From the Service Menu, perform the following:
- Use the arrow down button to scroll downwards to Export and Import, then press Enter.
- Press the arrow down button to select Import Configuration, then press Enter.

The following message will appear:
"Import configuration files from the USB device. The imported configuration will not have any impact on the running system. To use the imported configuration, please restart the system."
- To execute the command, press the left arrow button to select Accept, then press Enter.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 73

13.5 Backup Current Configuration

- To perform an internal backup of a current configuration, enter the service menu (see chapter 13.2), then perform the command Backup Current Configuration.

This command allows you to take an internal backup of the current configuration.

> **Make sure to save all recent configuration changes (using the Save Configuration command in the System Settings menu, chapter 13.7) before executing the Backup Current Configuration command.**

From the Service Menu, perform the following:
- Use the arrow down button to scroll downwards to Export and Import, then press Enter.
- Press the arrow down button to select Backup Current Configuration, then press Enter.

The following message will appear:
" Create backup of the current configuration. Please save the configuration if configuration has been changed".

- To execute the command, use the left arrow button to select Accept, then press Enter.

13.6 Select Configuration & Restart System

This command allows you to restart the system by using one of the configuration files available (current configuration, imported configuration or backup configuration).

From the Service Menu, perform the following:
- Use the arrow down button to scroll downwards to Export and Import, then press Enter.
- Press the arrow down button to select Select Configuration & Restart System, then press Enter twice.

  The following message will appear:
  " Restart the system by using one of the configurations available".

- If several configurations are available, use the left/right arrow buttons to select the configuration (Current Configuration, Imported Configuration or Backup Configuration).
- Press Enter.
- To execute the command, press Enter once more.

*Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS*

Page 74

13.7 Save Configuration

Each time a configuration has been changed, this command should be run. The changes will not become effective until a Restart System command is performed.

From the Service Menu, perform the following:
- Press Enter to select System Settings.
- Press Enter twice to select Save Configuration.
- Type a new Site Name, or accept the existing one by pressing the arrow down button.
- Type a new Operator Name, or accept the existing one by pressing the arrow down button.
- Press Enter to type a new Site Configuration Version then press Enter, or accept the existing one by pressing the arrow down button.
- Press Enter to type a new Description then press Enter, or accept the existing one by pressing the arrow down button.
- To confirm, press Enter.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 75

14. Changes on the Detection Loop

14.1 Typical Scenarios

This chapter provides information on how changes on the detection loop affect the system during normal operation.

The table below gives an overview of typical scenarios for various examples, including the actions to be carried out and the panel indication (visual/audible).

Note that some fault messages may not appear if a change is done rapidly (for example, a unit is removed and another unit is inserted rapidly). However, the procedures will be the same, regardless of how quick the changes are done.

Before a point is to be added or removed from the loop (for example, a new detector base for a detector is added or an existing is removed), the detection loop in question has to be disabled after entering service mode. When the change has been done, the detection loop has to be enabled.

14.2 Remove a unit and Insert the same unit

Scenario during normal operation / actions to be carried out		Panel indication (visual/audible)
For example, remove an optical smoke detector BH-300 from its base, and reinsert the same one into the base.		
1	Remove the detector from its base.	Observe two fault warnings: "Loop Cable Fault" "Loop Unit not responding"
2	Acknowledge all faults.	Buzzer off, indicator to steady
3	Insert the same detector.	No change
4	Operate reset.	Panel to quiescent condition.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 76

14.3 Remove a unit and insert another unit of the same type

Scenario during normal operation / actions to be carried out	Panel indication (visual/audible)
For example, remove an optical smoke detector BH-300 from its base and insert another optical smoke detector BH-300 into the same base	
1 Remove the detector from its base.	Observe two fault warnings: "Loop Cable Fault" "Loop Unit not responding"
2 Insert another detector of same type in the base.	Observe fault warning "Loop Unit has been replaced"
3 In service menu, select System Settings/Save Configuration, then Restart System.	After restart of system observe quiescent condition on the panel.

14.4 Remove a unit and insert another unit of a different type

Scenario during normal operation / actions to be carried out	Panel indication (visual/audible)
For example, remove an optical smoke detector BH-300 from its base and insert a heat detector BD-300.	
1 Remove the detector from its base.	Observe two fault warnings: "Loop Cable Fault" "Loop Unit not responding"
2 Insert a detector of a different type in the base.	Observe fault warning: "Loop unit has been replaced"
3 In service menu, select System Settings/Save Configuration, then Restart System.	After restart of system observe quiescent condition on panel.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 77

14.5 Add a new unit to the detection loop

Scenario during normal operation / actions to be carried out	Panel indication (visual/audible)
For example, an optical smoke detector BH-300 is added to the detection loop.	
1	Enter service mode and disable the detection loop in question.	
2	Mount a new base on the detection loop.	
3	Insert the new detector in its base.	
4	Enable the detection loop.	Observe fault messages: "Topology has Changed" "Configuration Mismatch"
5	From the menu check the loop topology.	Observe that the topology is in accordance with the new detector added.
6	Add the appropriate properties to the new unit (Service Menu/Unit Configuration/Points).	
7	In service menu, select System Settings/Save Configuration-Restart System. Accept restart of system.	After restart of system observe quiescent condition on panel.

14.6 Remove a loop unit from the detection loop

Scenario during normal operation / actions to be carried out	Panel indication (visual/audible)
For example, an existing heat detector BD-300 is removed from the detection loop.	
1	Enter service mode and disable the detection loop in question.	
2	Remove the detector from its base and repair the cable break.	
3	Enable the detection loop.	Observe fault messages: "Topology has Changed" "Loop Cable Fault" "Loop Unit is Not Responding"
4	From the menu check the loop topology.	Observe that the topology is in accordance with the new detector added. An "X" sign is indicated at the position of the removed unit
5	In service menu, select System Settings/Save Configuration. Accept to view list of units to be removed.	The removed unit is presented in the list
6	Mark the unit by pressing the Select button an then the Function button. Press Enter button to start the command "Remove Unit From Configuration", and finally accept the command. Complete parameters to save the configuration.	
7	In service menu, select System Restart System. Accept restart of system.	After restart of system observe quiescent condition on panel.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 78

14.7 Major Changes / Clear Loop Config. - Restart System

Note that, when major changes are to be done on an existing detection loop, i.e. a large amount of points on an existing detection loop are to be removed and others are to be added, it is recommended to use the command Clear Loop Config. - Restart System. This command allows you to delete *all* points on a *selected* detection loop, meaning that you can start from the beginning configuring the detection loop in question.

For further information, refer to the Configuration Handbook.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 79

15. Changes on the Panel Bus

15.1 Typical Scenarios

This chapter provides information on how changes are to be carried out on the panel bus (typical scenarios), plus the panel indication (visual/audible) and the results of the changes.

15.2 Adding an extra panel to the Panel Bus

Step	Task	Expected results
For example, an Information Panel BV-210 is added to the Panel Bus.		
1	The system is to be in quiescent condition. Enter access level 3 (service mode).	
2	Add a new panel to the panel bus. Make sure that the panel's address (refer to Addressing Panels, chapter 6) is not already used for other existing panels.	Within 100 seconds the Fault indicator starts to pulse and the internal buzzer is turned on. The panel display shows the following message: "Panel topology mismatch"
3	Press the Mute Panel button	The internal buzzer is turned off.
4	Acknowledge the fault by pressing the Function button, then press the Enter button to accept.	The Fault indicator goes steady.
5	Save the configuration and restart the system	The system restarts. The system starts in quiescent condition, and the new panel is operative.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 80

15.3 Removing a panel from the Panel Bus

Step	Task	Expected results
For example, a Fire Brigade Panel BU-210 is removed from the Panel Bus.		
1	The system is to be in quiescent condition. Enter access level 3 (service mode).	
2	In service menu, select System Topology and observe the current state of the panel bus and number of units on the panel bus	
3	Remove a panel from the panel bus by disconnecting the cables from the panel.	Within 100 seconds the Fault indicator starts to pulse and the internal buzzer is turned on.
4	Connect the wires where the break is.	Within 100 seconds the Fault indicator starts to pulse and the internal buzzer is turned on.
5	Wait up to 100 seconds.	Observe that panel bus topology is reduce by 1 unit
6	In the service menu, select System Settings/Save Configuration. Accept to view list of units to be removed.	The removed unit is presented in the list
7	Mark the unit by pressing the Select button an then the Function button. Press Enter button to start the command "Remove Unit From Configuration". Complete parameters to save the configuration.	

15.4 Replacing a panel of the same type and with the same address

Step	Task	Expected results
For example, a Repeater Panel BS-211 is to be replaced by another Repeater Panel BS-211 with the same address.		
1	The system is to be in quiescent condition. Enter access level 3 (service mode).	
2	In service menu, select System Topology and observe the current state of the panel bus and number of units on the panel bus	
3	Replace a panel with another one of the same type and the *same* address.	Within 100 seconds the Fault indicator starts to pulse and the internal buzzer is turned on.
4	Wait until the number of units on the panel is correct	
5	Save the configuration and restart the system.	The system restarts. The system starts in quiescent condition.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 81

15.5 Replacing a panel of the same type but with a different address

Step	Task	Expected results
For example, a Repeater Panel BS-211 is to be replaced by another Repeater Panel BS-211 with a different address.		
1	The system is to be in quiescent condition. Enter access level 3 (service mode).	
2	In service menu, select System Topology and observe the current state of the panel bus and number of units on the panel bus	
3	Replace a panel with another one of the same type but with a *different* address (not used by any other panels on the panel bus).	Within 100 seconds the Fault indicator starts to pulse and the internal buzzer is turned on.
4	Wait until the number of units on the panel is correct	
5	In the service menu, select System Settings/Save Configuration. Accept to view list of units to be removed.	The removed unit is presented in the list
6	Mark the unit by pressing the Select button an then the Function button. Press the Enter button to start the command "Remove Unit From Configuration". Complete parameters to save the configuration.	
7	In the service menu, select System Restart System.	The system restarts. The system starts in quiescent condition.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, Autronica Fire and Security AS

Page 82

15.6 Replacing a panel of a different type

| Step	Task	Expected results
For example, a Repeater Panel BS-211 is to be replaced by an Information Panel BV-210. **System behaviour does not differ if the new panel use the same or different address.**		
1	The system is to be in quiescent condition. Enter access level 3 (service mode).	
2	In the service menu, select System Topology and observe the current state of the panel bus and number of units on the panel bus	
3	Replace a panel with another one of the same type. You may keep the same address as the previous panel, or change to a *different* address (not used by any other panels on the panel bus).	Within 100 seconds the Fault indicator starts to pulse and the internal buzzer is turned on.
4	Wait until the number of units on the panel is correct	
5	In the service menu, select System Settings/Save Configuration. Accept to view list of units to be removed	The removed unit is presented in the list
6	Mark the unit by pressing the Select button an then the Function button. Press the Enter button to start the command "Remove Unit From Configuration". Complete parameters to save the configuration.	
7	In the service menu, select System Restart System.	The system restarts. The system starts in quiescent condition.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19, *Autronica Fire and Security AS*

Page 83

16. Charger Calibration

The charger is factory calibrated. If an Autroprime system gives the fault message «Charger Control Output Fault", the charger needs to be calibrated.

The procedure is as follows:

1. If the system is running, enter the service menu (chapter 13.2) and shut down the system

2. To power off the BSA-200A board, disconnect fuses F1 and F2
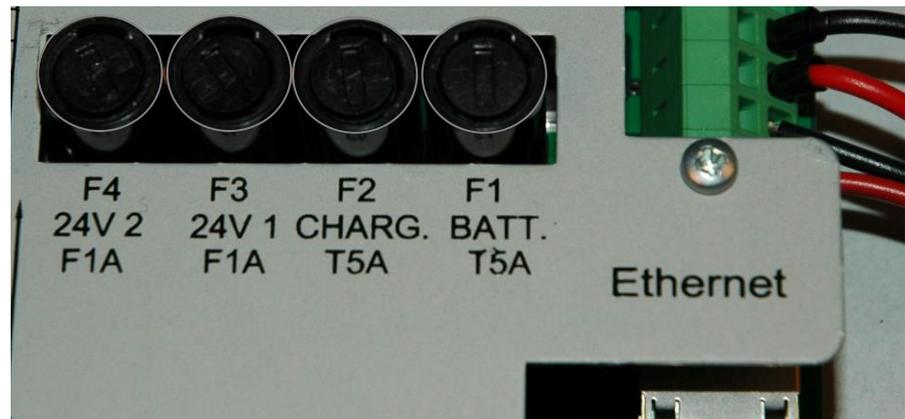
3. On the charger (consult the picture below), use a multimeter to monitor the DC voltage between terminals " –V " and " +V " while slowly adjusting the plastic knob "V ADJ" until the multimeter shows 27.2 V
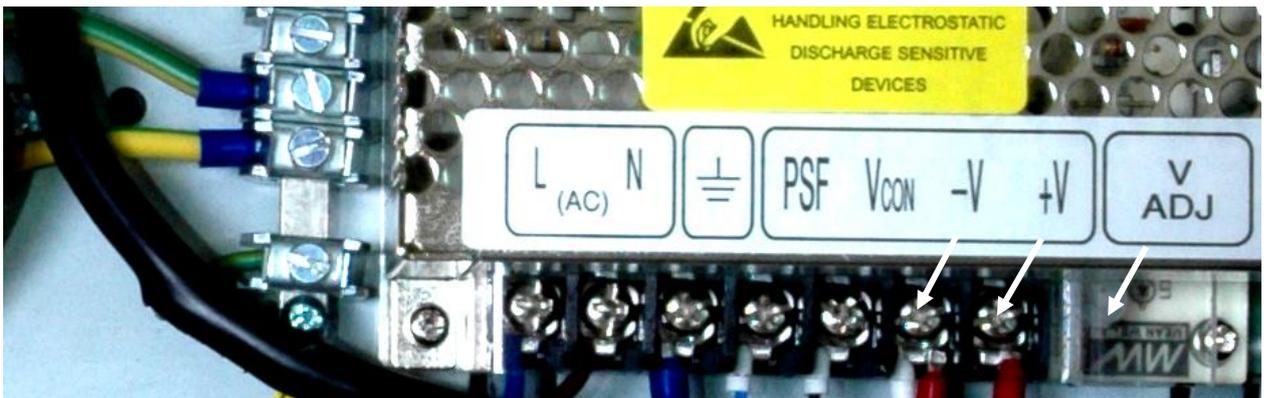
4. Re-connect fuse F1 and then fuse F2 to start the system

If the charger cannot be calibrated to 27,2V +3% (minimum 26,4V and maximum 28,0V), it must be replaced with a new charger.

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 84

17. Appendix

17.1 Text Foils

Autroprime supports the following languages (listed in alphabetical order):

Danish (DK)
Dutch (NL)
English (GB)
Finnish (SF)
French (F)
German (D)
Hungarian (H)
Icelandic (IS)
Italian (I)
Norwegian (N)
Polish (PL)
Portuguese (Brazilian) (BR)
Russian (RUS)
Spanish (E)
Swedish (S)

The text foils in the relevant language are to be inserted in the correct locations (there are two different types of foils). The table below gives an overview of the different textfoils (part numbers for indicators and keypads) and for the various languages (the letters XX indicate the language, DK, NL, etc.).

Text foils for:	Indicators	Keypad
Operator Panel BS-210 (integrated part of BS-200/BS-200M) and Repeater Panel (BU-200)	E-2717/XX-1	E-2717/XX-2
Fire Brigade Panel (BU-210)	E-2721/XX-1	E-2721/XX-2
Information Panel (BV-210)	E-2735/XX-1	E-2735/XX-2
"Larmlagringspanel" (BU-211)	E-2736/XX-1	E-2736/XX-2

Installation Handbook, Autroprime Interactive Fire Detection System, 116-P-APRIME2-INSTAL/DGB, Rev. D, 2017-04-19,
Autronica Fire and Security AS

Page 85