Specifications - SEP01

Function

The SEP01 Slave Expansion Module allows Comfort II to be expanded beyond 16 Inputs and 16 Outputs. Each Slave contains 8 Inputs and 8 outputs, which can be expanded by connecting LEM01-M2 (8 inputs, 8 outputs) or LEM02-M2 (8 inputs). The SEP01 consists of

- SEM01-M2: Slave Expansion Module PCB with 8 inputs, 8 outputs, regulator/charger for 12V battery 7AH sealed lead acid battery
- Transformer T230V 230V to 14-16VAC 2.5 Amps.
- EN01 enclosure 310 x 350 x 95 mm or
- EN03 enclosure 358 x 375 x 95 mm

The model names SEP01 and SEM01 will be used interchangeably.

Zone Inputs

- 8 fully programmable zones expandable to 16 with Local Expansion Module (LEM)
- Each zone configurable for 0 or 2 end-of-line resistors
- Up to 32 predefined Zone types to simplify zone configuration
- Surge/Over voltage protection for each zone

Open-collector Outputs

- 8 open collector outputs on main board, expandable to 16 with Expansion module.
- Each output can drive external relay or infrared transmitter for remote control appliances. Relay Modules with 4 relays are available.
- Selectable Pulsed or Steady output activation.
- Programmable Infrared signals at any output.
- Over voltage and Surge-protected outputs.
- Maximum 300 mA current limit for all 8 outputs on SEM. 300mA current limit for all 8 outputs on LEM01-M2s

Power Supply

- SEM01-M2 has built-in regulated 13.8V voltage supply and battery charging circuit. Supplies 1A DC max to 12V, S12V and outputs combined. independent of the main Comfort panel. This allows the 12V power in the whole system to be distributed between the Comfort and Slave power supplies. Each SEM01 requires its own 12V 7 AH back-up battery.
- SEM01 Quiescent current 50 mA max, 25 mA typical.

Auxiliary Supply Outputs

- 12V unswitched supply
- S12V switchable supply (programmable for reset operation)
- Note: Both 12V and S12V auxiliary supplies and 8 Outputs have a combined continuous current limit of 1A, protected by common resettable fuse of 1.3A

System Supervision

- Individual Zone tamper (open-circuit or short-wiring) with 2 end of line resistors
- Dedicated 24 hour Tamper input

Input/Output Expansion

Each Slave Expansion Module can be expanded using one of the Local Expansion Modules

- LEM01 - Local Expansion Module 8+8 (8 zones, 8 outputs)
- LEM02 - Local Expansion Module 8+0 (8 zones, 0 outputs)
- LEM03 - cannot be used with SEM01/02

Each Slave can support a total of 16 inputs and 16 outputs. 5 SEMs can be installed in a Comfort System, giving a system capacity of 96 inputs and outputs. LEM03 (16 input 0 Output LEM) cannot be used with a SEM, and cannot be connected to the main Comfort panel when a SEM is also installed.

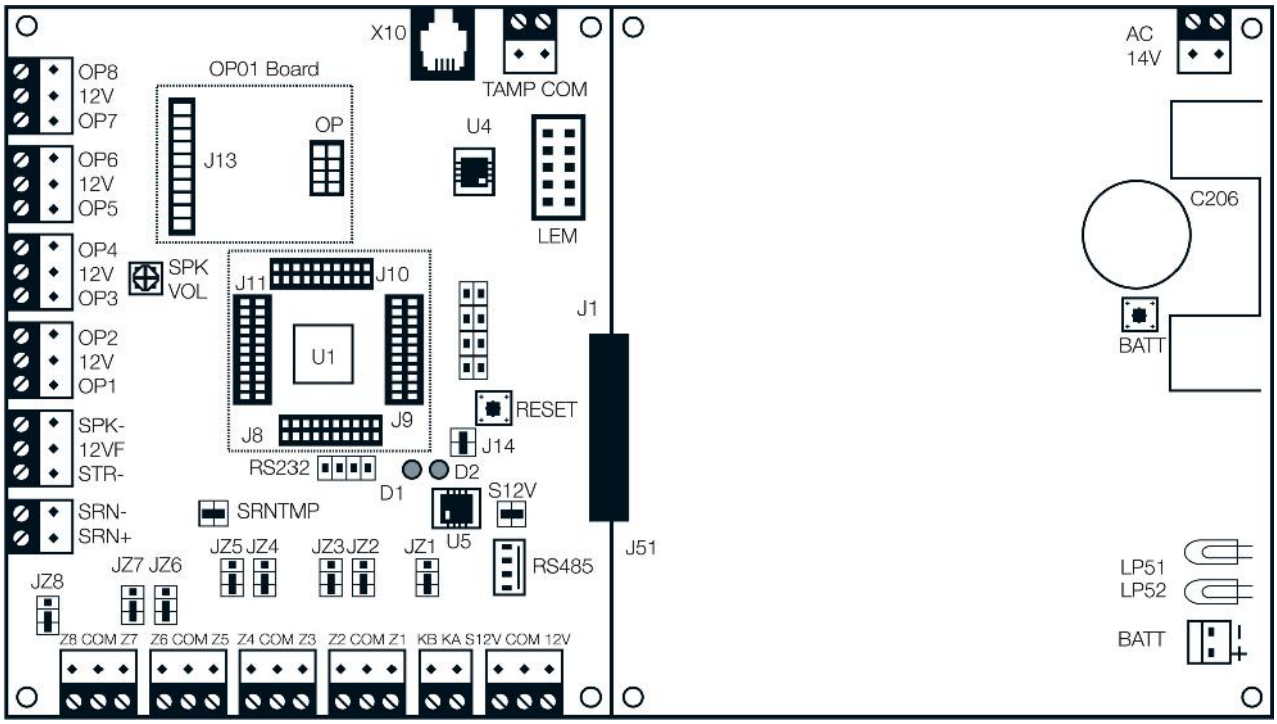
Size

- SEM01-M2: 230 x 130 mm.

Alarm Outputs

- Siren (12V) Output
- Speaker output for Internal speaker 8 ohm to 32 Ohms
- Strobe (12V) Output - From firmware SEM 5.167
- Siren Output for 12V siren

SEM01-M2 PCB



SEM01-M2 Printed Circuit Board

SEM01-M2 consists of 2 printed circuit boards joined together at the centre: A Digital section (on the left in figure 1) and a Power Supply section on the right in the above illustration.

ICs

- U1 - Program IC. This IC contains the firmware for the SEM's embedded behavior. This can be replaced for firmware upgrades.
- U5 - RS485 Interface IC.

Connections

- AC 14V - Transformer Input connection
- BATT - 12V Battery Connection for Sealed Lead-Acid Rechargeable Battery
- Z1/COM/Z2: Zones 1-2 input connections

- Z3/COM/Z4: Zones 3-4 input connections
- Z5/COM/Z6: Zones 5-6 input connections
- Z7/COM/Z8: Zones 7-8 input connections
- 12V/COM/S12V: Unswitched and Switched 12V Supply (3 way terminal block)
- OP1/12V/OP2 – Outputs 1,2 and Common 12V
- OP3/12V/OP4 – Outputs 3,4 and Common 12V
- OP5/12V/OP6 – Outputs 5,6 and Common 12V
- OP7/12V/OP8 – Outputs 7,8 and Common 12V
- KA/KB: RS485 Bus. This is connected via twisted pair to the same terminals of Comfort
- TAMP/COM- Connection to Tamper Switch. Short terminal block with wire-link if Tamper Input is not used.
- SRN+/SRN- Supply/ Connection to external Bellbox
- SPK-/12VF/STR - Connection to Internal Speaker and Strobe. The Strobe and Speaker outputs on the Slave implemented from Slave Firmware SEM 5.167 onwards
- LEM: Connector for LEM Plug-in board
- RS485 - 4 way header for RS485 4 way cable

Jumper Settings

- Reset Switch. This switch resets the SEM and is normally not used.
- JZ1 -JZ8 3x8 way header - Insert shunt in the position nearest the terminals for the corresponding Zone 1 to 8 if no EOL resistor is used for the zone. Insert a shunt in the position away from the terminal block if Double EOL resistors: 2K7 connected in series and 4K7 is connected across the contact.
- SRNTMP - This shoulld be shunted.
- S12V – shunt if S12V output is not to be switched. This means S12V is continuous 12V output and cannot be switched off
- ID (J2) - RS485 Address setting switches for SEM.

SEM ID/Shunt	A	B	C	D
1	Shunt	Shunt	Shunt	Shunt
2	Open	Shunt	Shunt	Shunt
3	Shunt	Open	Shunt	Shunt
4	Open	Open	Shunt	Shunt
5	Shunt	Shunt	Open	Shunt

LED Indicators

- D2 (Green) - Normally On. If this Slave ID is not addressed for 3 seconds, D2 will blink continuously. This indicates that the Number of Slaves in Comfigurator is not set correctly.
- D1 (Red) - Normally Off. If RS485 communications from Comfort is not received for 9 seconds, D1 will blink continuously. Hence if KA/KB is not connected, D1 and D2 will blink continuously.

The above blinking behavior is implemented in SEM 5.139

Installation

Location

The SEP01 should be mounted in a dry area, with access to an unswitched AC power source. It does not have to be next to the Comfort controller as

the RS485 bus allows a distance of at several hundred meters.

Mounting

Remove the knockout holes and mount the cabinet to the wall. Do not connect the transformer and backup battery until all other wiring is complete. Take precautions against damage by static discharge by using an anti static wrist strap tied to a suitable earth point.

A Local Expansion Module (LEM) may be mounted on top of a SEM PCB using 4 standoffs

RS485 Bus Connection

Connect the KA and KB terminals to the corresponding terminals (KA to KA, KB to KB) on the Comfort panel. Connect the 0V/COM of all the SEM and Comfort together

Normal CAT 5 cable can be used for connection of the SEM to Comfort, for up to 300 meters distance The SEM can be mounted up to 1 km away from the main Comfort panel provided shielded CAT 5 cable (STP or FTP) is used. Two pairs should be used to double up the 12V and ground pair for such long distances

The white 4 way RS485 cable can also be used to connect the Slave to Comfort if the distance is short enough.

If the Bus is not connected, the D2 (Red) LED will flash.

Transformer

The transformer secondary wires should be connected to the AC IN (JP51) terminal blocks through the mains inlet knockout hole. The plug-in transformer should be connected to an unswitched power supply outlet. Connect a 16 AWG green-jacketed solid conductor ground wire from the earth terminal on the studs provided on the enclosure to a metal pipe, grounding rod or other established earth ground for protection against lightning-induced surge.

☎ For UK Installations: The mains installation should be carried out by a qualified electrician in accordance with Electrical Wiring Regulations (BS 7671). As this is a permanently connected equipment, the fixed wiring must have a readily accessible disconnect device, e.g. isolation switch.

☎ Do not share the transformer secondary with any other equipment. Do not connect the transformer until all other wiring is completed.

Setting ID

Set the ID of the SEM using the ID (J2) shunts according to the table above under Jumper Settings. The 1st SEM should be ID=1, and other SEMs if connected should have sequential Ids up to 5. Each Module must have a unique ID otherwise a Communications Failure alarm will occur and the D2 (Green) LED will blink.

Tamper

Connect the Case Tamper to the Tamp/COM inputs. This causes a tamper alarm if the input is open.

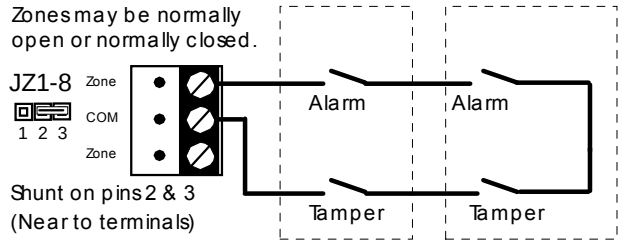
Backup Battery (JP2)

Connect a 12V 7 AH sealed lead-acid battery to the BATT (JP2) terminals. This will give more than 24 hours of standby power to the system if 200 mA

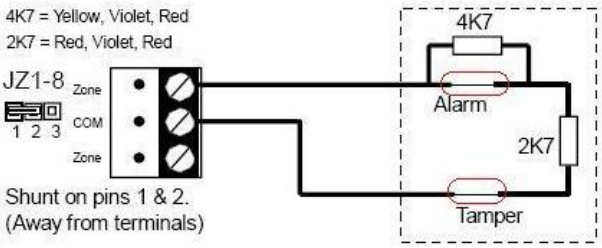
or less of auxiliary current is used. The LEM Expansion board requires less than 35 mA. Connect the positive terminal of the battery to the + terminal of the BATT connector and the negative terminal of the battery to the - terminal. The battery provides standby power to the system in the event of power failure and supplies additional current when required, e.g. to drive the siren during an alarm. The battery current is limited to 2.5A by a resettable fuse (F1). Do not connect the battery until all wiring is completed.

Inputs/Zone

Security sensors are connected to the Input terminals. Either No End-of-Line resistors (NEOL) or Double End-of-line (DEOL) resistors can be used for each Input. Each zone has a corresponding shunt JZ1 to JZ8 to determine setting for NEOL or DEOL.



Normally Closed Contacts without EOL Resistor



N.C or N.O contact with 2 EOL Resistors

☎ The 2K7 EOL Resistor can be substituted with 2K2 value. EOL resistors 2K2 with 4K7 are commonly used in some countries. If Comfort is installed in place of an existing system with these EOL resistors, then it may not be necessary to change the existing EOL resistors.

Input and Output Expansion with SEMs

Without any SEMs, the Comfort control panel with a LEM (Local Expansion Module) has 16 inputs and 16 outputs. Only 1 LEM may be connected to the Control panel, and this must be mounted inside the same metal enclosure. LEM02 has 8 inputs without outputs, and LEM01 has 8 inputs and 8 outputs.

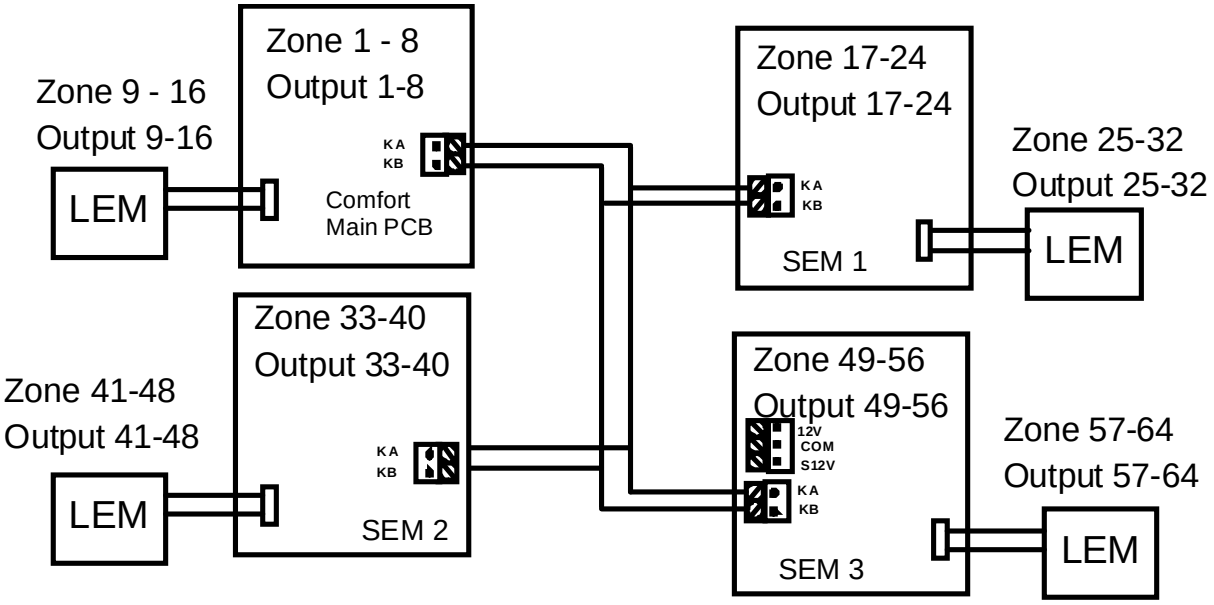
To expand the number of inputs and outputs beyond 16, SEMs must be used. Each SEM has 8 inputs and outputs. Each SEM may be connected to one LEM01 or LEM02 to provide a maximum of 16 inputs and 16 outputs for each SEM. The LEM may be mounted on top of the SEM01 using 4 metal standoffs screwed onto the 4 mounting holes

Up to 5 SEMs may be connected in a Comfort system, giving a maximum of 96 inputs and 96 outputs, provided a LEM is used for the control panel and each SEM.

Each SEM has an ID, set by headers. Refer to the table in “Jumper Settings”

section. If only one SEM is connected, then the ID must be set to 1. The next SEM added must be 2, and the next should be 3.

The figure below shows the ID settings for each SEM, and the zones and output numbers associated with each SEM and LEM.



Connecting SEMs and LEMs

- The 16 zone LEM03 with no outputs cannot be used with the SEM or the Comfort panel when there are SEMs in the system. This LEM03 can only be used with a Comfort system without any SEMs
- Note that SEM Input and Numbering are fixed ie 17 to 24 for SEM 1 regardless of whether Local Expansion Modules are used.

Programming

Programming is done using Comfigurator and a UCM (Universal Communications Module with USB or Ethernet interface connected to a PC).

- If the SEM is installed, make sure that the LEM03 is disabled in Comfigurator > Configuration Modules & Settings screen). The 16 input LEM03 and SEM cannot be used at the same time in the same system.

Alarm Reporting

Each SEM monitors and reports the following conditions to the Control Panel

Low Battery

When the battery voltage drops to a level (approximately 11 V), a low battery condition is reported to the Comfort Control panel. This is reported on the Event Log and announcement as “Battery Warning, id”, where id is the RS485 ID, i.e. 33 = SEM 1, 34 = SEM 2, 35 = SEM 3. A low battery condition on the Control panel will be reported as ‘Battery Warning, 1”.

Mains Failure is not reported by the SEM as this may result in multiple alarms if there is a general mains failure in the area.

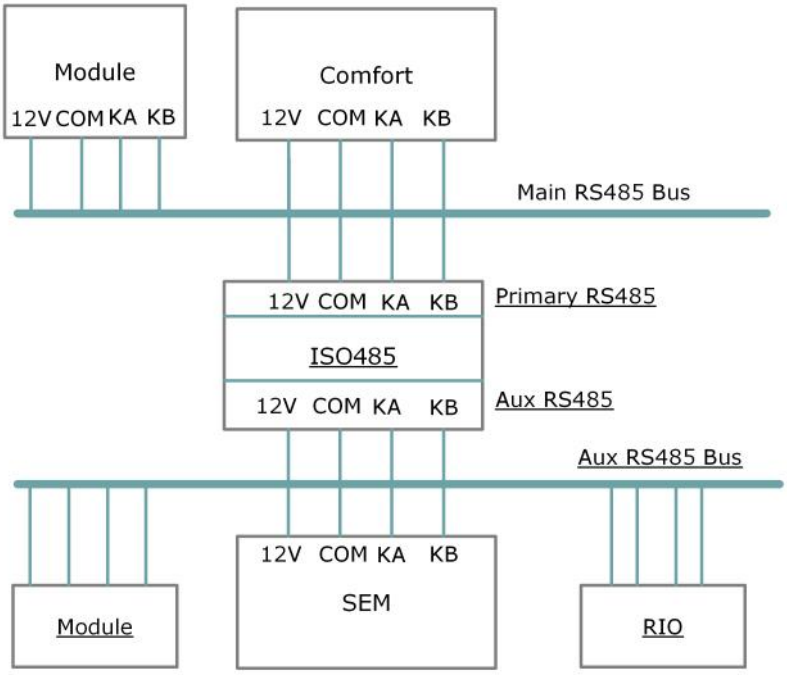
Tamper

The Tamper input is monitored as a 24 hour alarm, and reported to the Comfort Control panel as “Tamper Alarm, id” The meaning of id is as

explained above.

Bus Isolation

For a Comfort RS485 bus network which extends over a long distance and has many modules, the ISO485 Bus Isolator is available to isolate sections of the network from the other sections. The weakness of a bus network is that if the bus is shorted at any point the whole network is shorted and none of the modules eg Keypads, Door stations, UCM, SEMs can communicate. The ISO485 Bus Isolator has two RS485 ports or interfaces; Primary and Auxiliary. Both ports are electrically isolated from each other so that if there is a short on one side of the bus, it does not affect the other port.



Isolated RS485 Networks

The Primary and Auxiliary ports on the ISO485 are interchangeable. The figure above shows the Primary RS485 port connected to the main Comfort Bus and the Auxiliary port connected to the SEM. The 12V/COM on the Primary port is connected to Comfort while the 12V/COM on the auxiliary port is connected to the 12V/COM on the SEM. The SEM power supply is isolated from the power supply of other SEMs and Comfort. Other Comfort modules which have RS485 interfaces can be connected and powered from the SEM RS485 bus.

Several of the ISO485 bus isolators can be used in a system, one for each SEM. This way if there is a failure of the SEM or the RS485 bus on its side, this does not affect the Main RS485 bus and provides increased system reliability

Document History

Rev 4.04 - 4 April 2014

Updated ID settings for 5 SEMs

Rev 4.03 - 26 November 2012

Updated content

Rev 4.0.2 - 4 December 2010

Reformatted to A4, Included Firmware history for SEM 5.175

Rev 3.1.0 - 17 May 2009

Firmware history till 5.167, Described ISO48, Added Strobe and Speaker outputs enabled

Rev 3.0.1 - 22 May 2007

Added Firmware and comparison Table. Corrected distance

Rev 3.0.0 - 21 Sept 2006

Initial Release

Important Note

The printed manual may not always be the most current version. Please check and download the latest version from http://www.cytech.biz/manuals.html

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