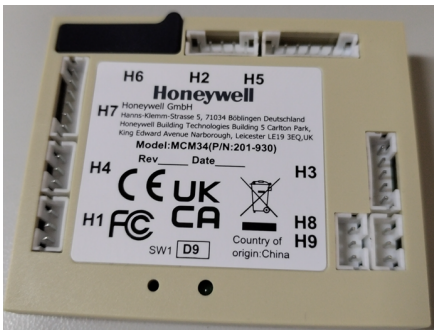
INNCOM MCM34 CONTROLLER

Micro controller Module

The MCM34 multipurpose module can facilitate several functions in INNCOM's Integrated Room Automation System (IRAS). The CBL32 MCM34 is equipped with a 32-bit microprocessor and combines the features of the previous 8-bit microprocessor equipped with CBL8 PC485.S5 and B564 devices. The MCM34 is a general-purpose interface module device developed to communicate and function with Honeywell's INNCOM System-5 devices, protocols, and applications.



FEATURES AND BENEFITS

- Provides room- gateway functionality for any S5bus member lacking inherent room gateway functionality.
- Compact housing, designed to fit inside small enclosures such as single gang wall boxes..
- The MCM34 is the preferred driver for external chimes or a 12VDC Power Relay. In conjunction with a power relay, the MCM34 becomes a master lighting controller (the X09) as an interface between INNCOM's Energy Management System occupancy sensor logic and unit-controlled lighting loads.
- Two Analog inputs that measure the availability of hot/ cold water in a 2-pipe HVAC system or measure external thermistor inputs for outside air temperature sensing and display.
- Two 0-10V analog outputs that can provide 0-10V control of HVAC or Lighting controllers.

COMPATIBILITY/FUNCTION COMPARED TO THE REPLACEMENT PARTS – B564 AND PC485.S5

PARAMETER	SPECIFICATION
Is it straight swap for the replacement?	NO
Is any rewiring required?	YES*
Is the new unit the same footprint?	NO**
Are the new units compatible with the replacement?	YES
Is any re-programming work required on the server side and rest of the hardware products in a same room?	NO

* A B564 common use was its single Analog Input to connect a 10K thermistor to measure and report Pipe Water Temperature. This was Pins 1 (Gnd) and 7 (Analog In) on the B564 7 pin Header H2.

The MCM34 has 2 Analog Inputs on 3 pin Header H4. So, if replacing the B564 with an MCM34, the 2 wires from the 10K thermistor must be removed from the existing 7 Pin harness used by the B564 and connected to MCM34 Header H4 3 pin harness pins 1,2 Analog In 1 (or 1,3 Analog In 2).

**The MCM34 housing is larger than the PC485 or B564 housing. You need to take this into consideration when replacing the PC485 or B564 with the MCM34.

TECHNICAL SPECIFICATIONS

ENVIRONMENT

SPECIFICATION	RANGE/VALUE
Operating Temperature Range	0 - 40 °C
Operating Humidity Range	0 - 95 % RH

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
201-930	MCM34 Finished assembly

APPROVALS

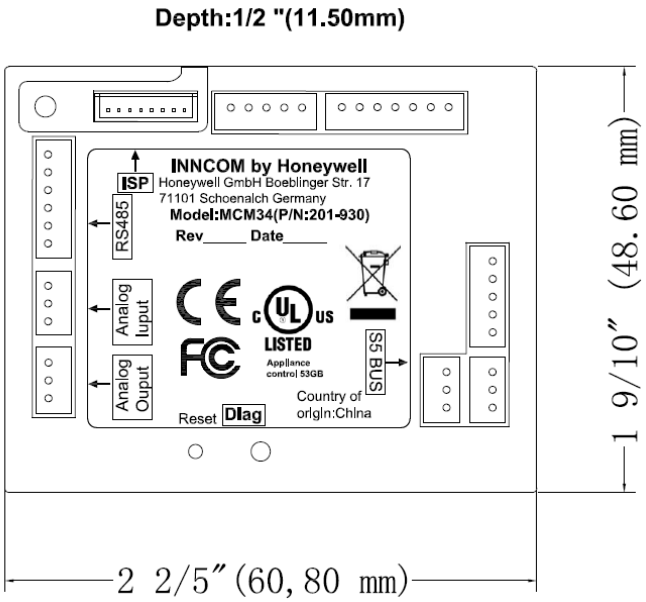
APPROVALS
FCC PART 15B, CE-LVD, CE-EMC and CB

Honeywell

ELECTRICAL

PARAMETER	SPECIFICATION
Operating supply Voltage	12 ± 0.25 VDC
Current Consumption	15mA to *35mA
NVRAM Capacity	256 Bytes
Program Code Capacity Volatile RAM	32 kBytes
Max. Injected Input Current IO1-IO5	3 mA, 0-5 VDC
Pull-up Resistor IO1- IO5 Input voltage range	IO1-IO5 10 kOhm
Max. Injected Input Current InOut 1-2	15 mA, 0-5 VDC
Pull-up Resistor InOut 1-2 Input Voltage Range	1.5 kOhm

DIMENSIONS AND OVERVIEW



FLN5 RS-485 ROOM GATEWAY CONFIGURATION

The MCM34 FLN5 Room Gateway configuration is typically used where a centrally controlled system that uses a wired RS-485 network (instead of a wireless RF network) is desired. Still, no in-room devices can connect to the FLN5 twisted pair wiring from a B576-L or B573 Floor Bridge, such as an E528.4G or PC502.4G. Such an example is an RF in- room only application. The in-room network between room devices is RF, and the MCM34 connects using an S5bus to the RF thermostat to provide the room gateway function towards the FLN5 network.

A typical use case for the MCM34 FLN5 RS-485 configuration is using the MCM34 as a drop-in replacement for the legacy PC485.S5 FLN5 Room Gateway

IMPORTANT NOTES:

- The MCM34 FLN5 RS-485 configuration can ONLY be used with a B573 or B576-L Floor Bridge that uses RS-485 FLN5 protocol. It can NOT be used with a B576-S floor bridge which uses the enhanced DM485 RS-485 protocol.
- The MCM34 does not have RS-485 driver hardware internally installed, but requires connection to an RS-485 adapter. The MCM34 supports either of the two available Inncom RS-485 adapter modules , the P/N 01-9489 B485 RS-485 adapter or the P/N 203-250 E7/E528 RS-485 adapter. The 01-9489 B485 adapter connects to the MCM34 H2 header or the 203-250 adapter connects to the MCM34 H7 header. Figures 1 and 2 below show how the MCM34 connects to these adapters.
- By default, the MCM34 has its RS-485 FLN5 driver and its Room Gateway functionality disabled. This can be enabled and configured from INNTool/EngINN , or the MCM34 when loaded with its standard “INNTool Shelf 100.255.38” software has 2 available I/O maps to enable the Room Gateway functionality and select what RS-485 adapter is used.
  - I/O Map 11 enables the Room Gateway and sets CBL32 Registry 193:11:0:0 RS485 Driver Setup > SerialPort setting to 0 which configures support for the 01-9489 B485 adapter connected to header H2.
  - I/O Map 12 enables the Room Gateway and sets CBL32 Registry 193:11:0:0 RS485 Driver Setup > SerialPort setting to 1 which configures support for the 203-250 E7/E528 adapter connected to H7.

2.49. Registry 193:11 RS485 Driver Setup

CBL32 Data Type: **TYPE_CBL32REG_193_11_RS485_DRIVER_SETUP**

Idx	Description of Parameter
0	**SerialPort**

Serial port index redirects the RS485 protocol data over the selected serial port.

Device	SerialPort	Output Header	Description
MCM34	0	H2	5-pin, B485 Dongle (PN 01-9489)
	1	H7	6-pin, RS485 dongle (PN 203-250)

Note: Only supported by MCM34.

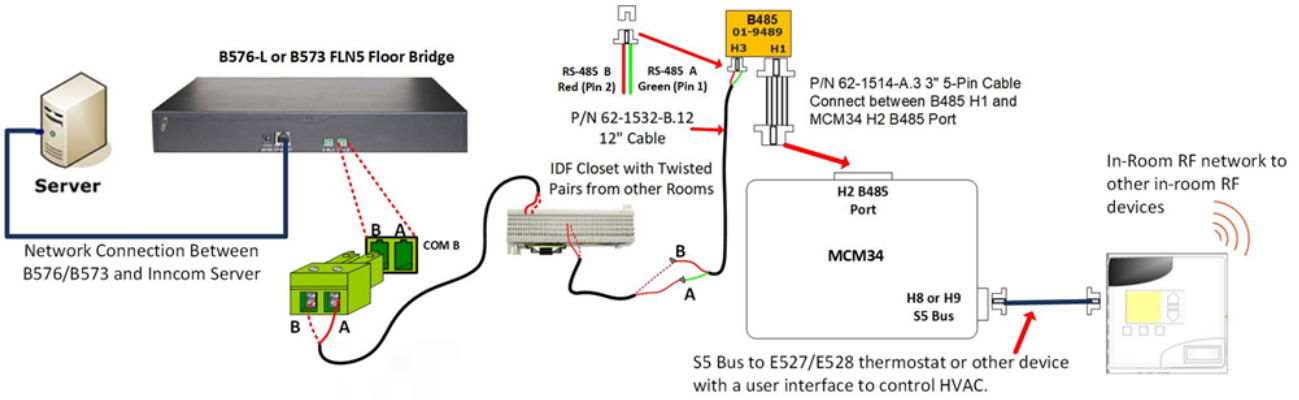


FIGURE 1 MCM34 RS-485 FLN5 ROOM GATEWAY TOPOLOGY USING 01-9489 B485 MODULE

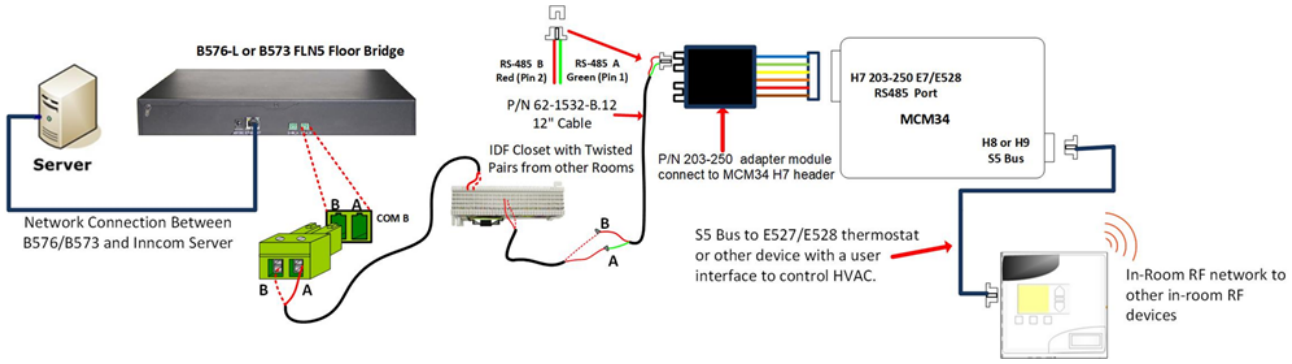


FIGURE 2 MCM34 RS-485 FLN5 ROOM GATEWAY TOPOLOGY USING 203-250 MODULE

X09 CONFIGURATION

Pairing the MCM34, a relay, and a power source creates a simple Master lighting application with a small footprint but robust circuit protection. It can be deployed where only one relay is needed to control the lighting feed circuit rather than using INNCOM's larger 5-relay X05/X06. With a 30A relay, the X09 ensures that the typical 20A breaker will trip before the X09 burns out. You can use X09 with a 2A or a 250 ˚A power supply. Figure 3 shows the wiring for a typical X09 Master lighting application. The X09 is designed to be installed by licensed electricians and requires additional installation materials (back boxes, separators, etc.) typically provided by them.

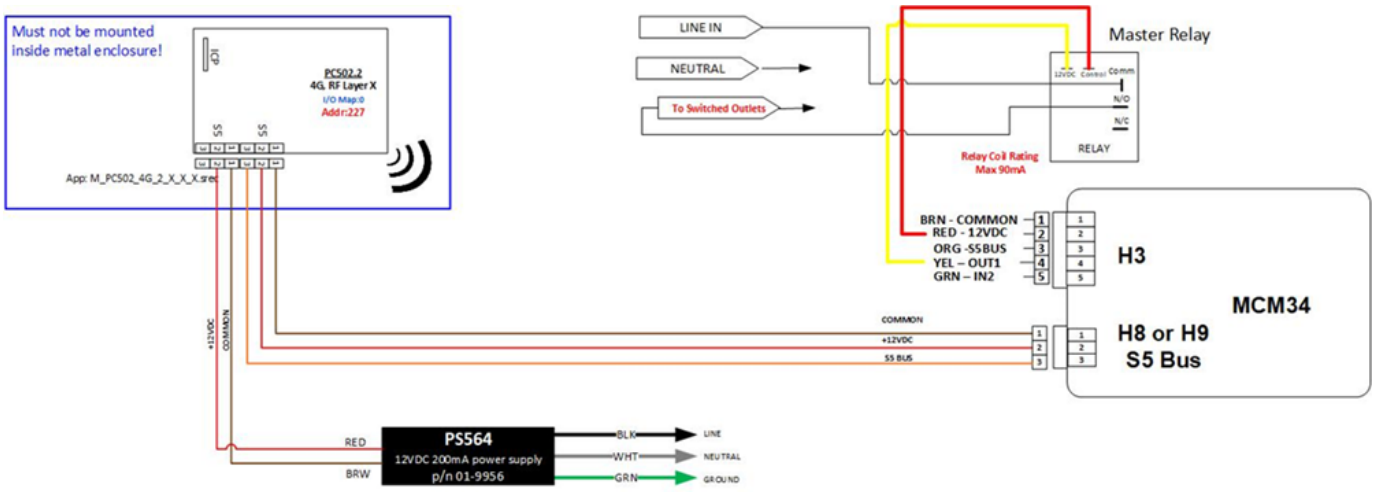


FIGURE 3 X09 MASTER LIGHTING WIRING

ANALOG INPUT CONFIGURATION

Header H4 provides the connections for two Analog Inputs can be used to measure the availability of hot/cold water in a 2-pipe HVAC system , measure outside air or discharge air temperature , or measure guestroom temperature using a standard 10K thermistor.

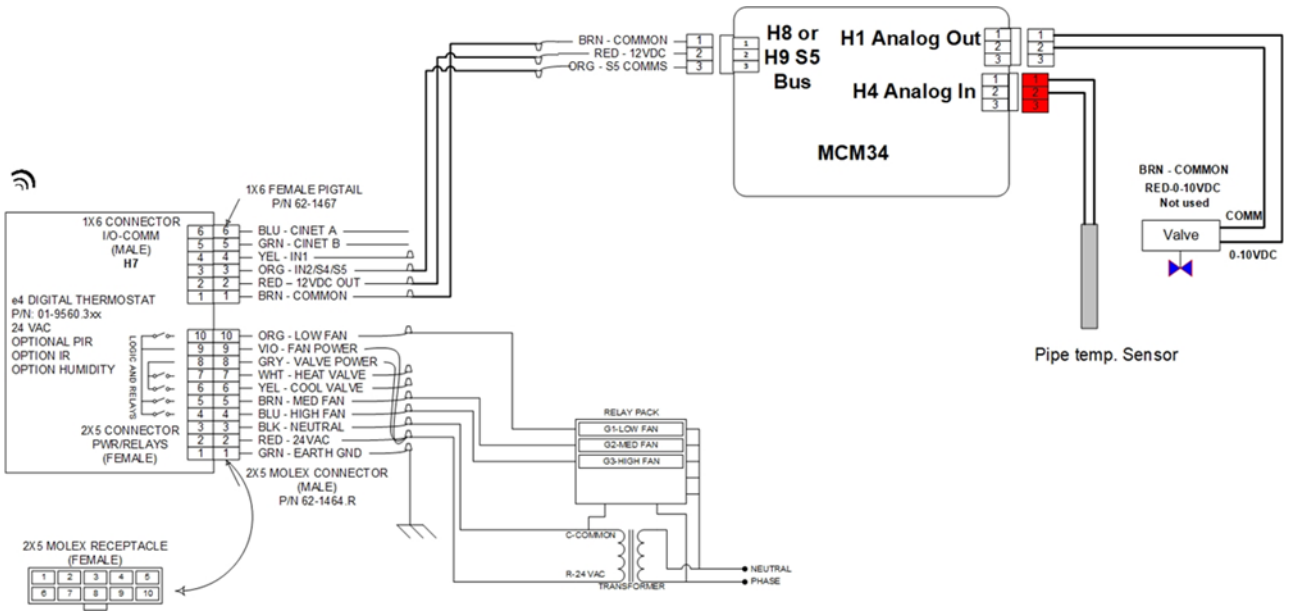


FIGURE 4 MCM34 EXAMPLE USING H1 ANALOG OUTPUTS AND H4 ANALOG INPUT

ANALOG OUTPUT CONFIGURATION

Header H1 provides the connections for two 0-10V Analog outputs that can be used to control 0-10VDC valve actuators, 0-10V fan Speed controllers or 0-10V lighting controllers.

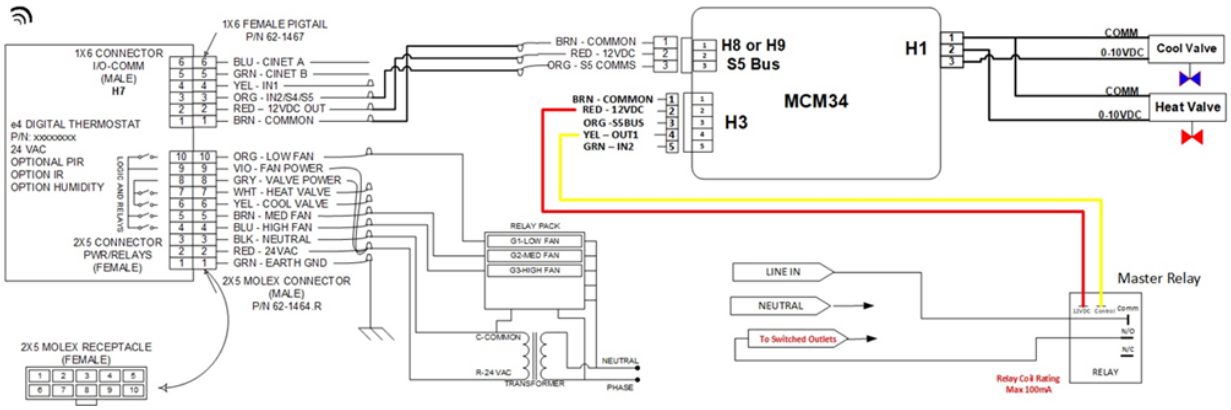


FIGURE 5 MCM34 EXAMPLE USING H1 ANALOG OUTPUTS AND H3 OPEN COLLECTOR OUTPUT EXAMPLE

MCM34 LOW VOLTAGE DIGITAL INPUTS AND OUTPUTS

The MCM34 has 5 low voltage digital input/outputs that can be configured as a low voltage input or output (H5 pins 3-7 - In/Out 1-5), 1 low voltage input (H3 pin 5 In 6) , and 1 Open Collector Output (H3 pin 4 Out 1) capable of sinking 100mA that can drive the coil of a power relay..

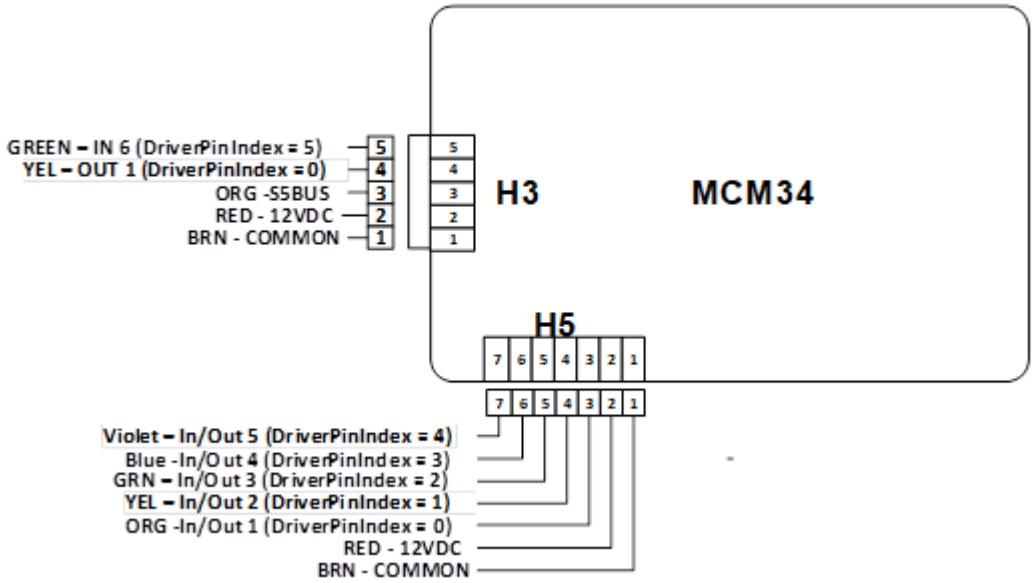


FIGURE 6 MCM34 LOW VOLTAGE INPUTS

With H5 pins 3-7 (In/Out 1-5), for the particular pin to be an Input there must be a 7:1:X Registry with a 7:1:X:0 DriverIndex = 1 (Std low voltage DC input) and 7:1:X:1 DriverPinIndex = 0 to 4 (the DriverPinIndex is the desired pin minus 1). So in the Figure 7 example, the MCM34 has three 7:1 Input Registry's for the three H5 inputs 1,2 and 4 . This could be 7:1:1, 7:1:2, 7:1:4. 7:1:1:0, 7:1:2:0 and 7:1:4:0 DriverIndex =1 (Std low voltage DC input) and 7:1:1:1, 7:1:2:1 and 7:1:4:1 DriverPinIndex = 0,1 and 3. The DriverPinIndex is always the Pin# -1. There can NOT be a 7:2:1, 7:2:2 or 7:2:4 Low Voltage Output Registry present in the MCM34 in this example since these pins are being used as an Input.

For H3 Pin 5 Input 6 (Green Wire), these ONLY supports being an Input, so there must be a 7:1:X:0 DriverIndex = 1 (Std low voltage DC input) and 7:1:X DriverPinIndex = 5. So in the Figure 7 example, if you want to use Registry 7:1:6 there must be a 7:1:6 Registry with 7:1:6:0 DriverIndex = 1 (Std low voltage DC input) and 7:1:6:1 DriverPinIndex = 5 (H3 Pin 5 green wire Input # 6).

The Inputs can be used to interface with lighting controls, drape controls, motion sensors, and door switch contact inputs. Each input is internally pulled up to 3.3VDC via a 10K resistor. A switch should be connected between the input pin and ground on the H5 (Inputs 1-5) or H2 (Input 6). For each input, a voltage near 3.3V is interpreted as logic zero (i.e., the connected switch is open), while a voltage near 0V (i.e., the connected switch is shut) is considered a logic one. However, all input states can be inverted internally in the software. The input pin should never be connected to a voltage source greater than 3.3V or less than 0V, as damage to the circuit may occur.

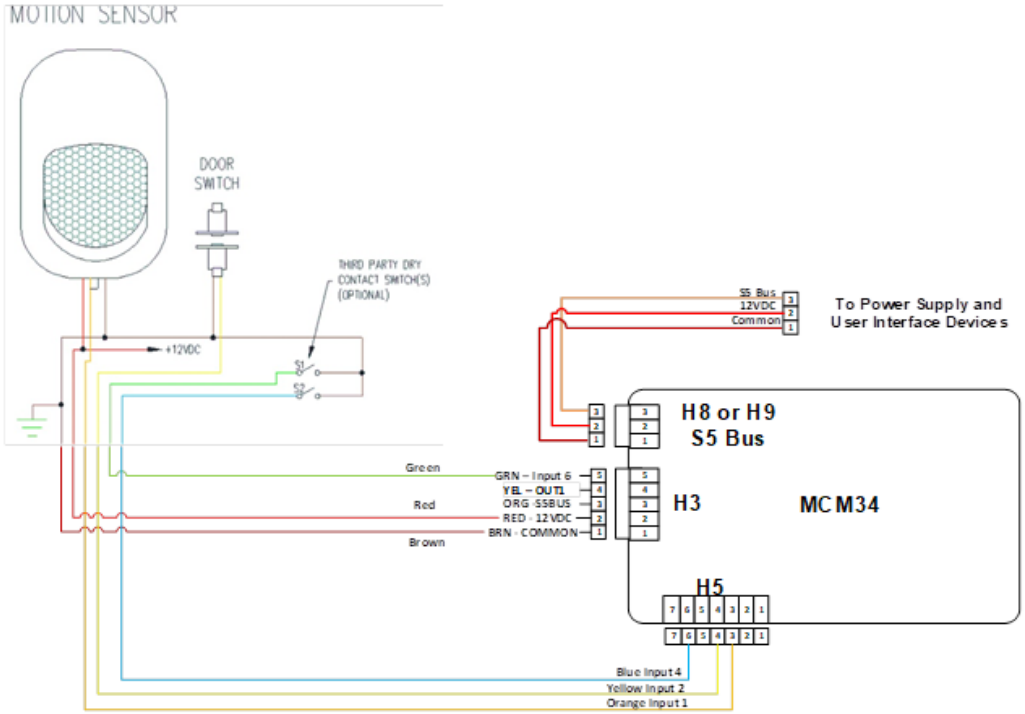


FIGURE 7 MCM34 LOW VOLTAGE INPUT WIRING EXAMPLE

With H5 pins 3-7 (In/Out 1-5), for the particular pin to be an Output there must be a 7:2:X Low Voltage Output Registry with a 7:2:X:0 DriverIndex = 0 (Std low voltage DC output) and 7:2:X:1 DriverPinIndex = 0 to 4 (the DriverPinIndex is the desired pin minus 1) associated with the output. So for the example in Figure 8, an LED is connected to H5 Pin 3 Orange wire (Out 1), Pin 5 Green wire (Out 3) and Pin 7 Violet wire (Out 5). To control the connected LED's, you could create Registry 7:2:1 , 7:2:3 and 7:2:5. 7:2:1:0, 7:2:3:0 and 7:2:5:0 DriverIndex = 0 (Std low voltage DC output) and 7:2:1:1, 7:2:3:1 and 7:2:5:1 DriverPinIndex = 0,2,4. You can NOT have a 7:1:X with the same DriverPinIndex..

IMPORTANT: The MCM34 H5 Low Voltage pins 3-7 are internally pulled up to +3.3 VDC via a 10 KOhm resistor. This limits the amount of current the outputs will source, so the intended use is to just turn ON a connected LED indicator.

For H3 Pin 4 Open Collector Output 1 , there must be a 7:2:X:0 DriverIndex = 1 (Std Relay Output) and 7:2:X:1 DriverPinIndex = 0. So for example, if you want to use Registry 7:2:3 and use the H3 Pin 4 Yellow wire Open Collector output, there must be a 7:2:3 Registry with 7:2:3:0 DriverIndex = 1 (Std Relay Output) and 7:2:3:1 DriverPinIndex = 0 (H3 Pin 4 Out 1 yellow wire).

MCM34 DIGITAL OUTPUT

The MCM34 has one low voltage output on Pin 4 of header H3. This output is an Open Collector transistor output capable of sinking 100mA that can drive the coil of a power relay. This allows the MCM34 to be configured as Master Contactor to switch power to room lighting based on room occupancy or to control a Chime relay.

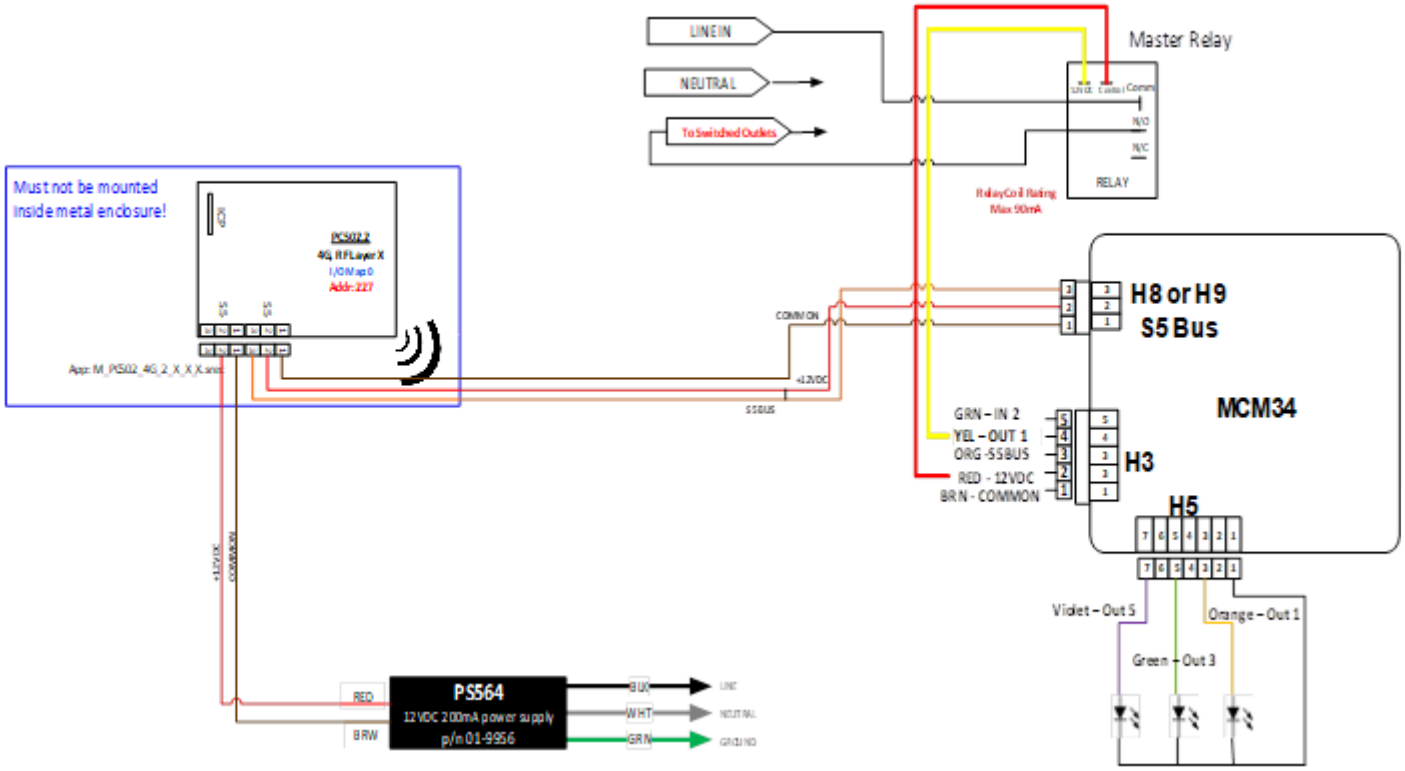
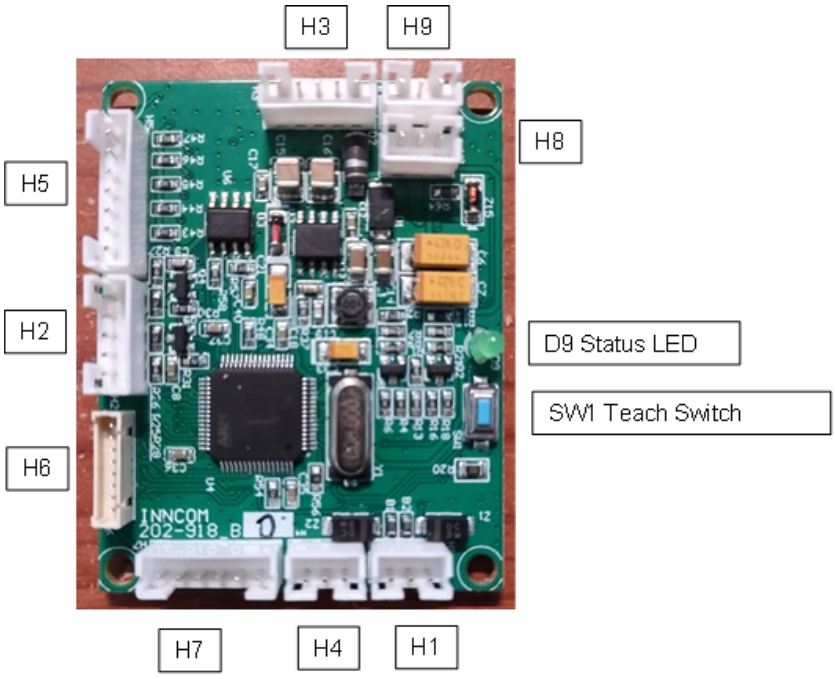


FIGURE 8 MCM34 LOW VOLTAGE OUTPUT EXAMPLE

MCM34 HEADERS

HEADER	PIN	SIGNAL	FUNCTION	TYPICAL WIRE COLOR	NOTES
H1 -Analog Out 1,2	1	Gnd	Common	NA	NA
	2	AO1	Analog Out 1		Driver_index_10V_DC-Pin Index 0
	3	AO2	Analog Out 2		Driver_index_10V_DC-Pin Index 1
H2-In/Out 1,2 (Primary FLN RS-485 connection that uses 01-9489 B485 adapter)	1	Gnd	Common	NA	Connect a 01-9489 B485 module to H2 using 5 pin 62-1514-A.3 cable. Registry 193:11:0:0 SerialPort must be set to 0 in the MCM34.
	2	VEE+12V	12 VDC		
	3	S5 Bus	Mult-drop communication bus		
	4	InOut1	UArt Tx		
	5	InOut2	UArt Rx		
H3- S5 bus with I/O	1	Gnd	Common	Brown	NA
	2	VEE+12V	12VDC	Red	
	3	S5 bus	Mult-drop communication bus	Orange	
	4	Out1	Open -Collector Output	Yellow	Driver_Index_Relay-Pin Index 0
	5	In2	0-3.3 DC Dry Contact Input	Green	Driver_Index_LV_DC- Pin Index 5 In6 pulled up to 3.3V via 10K resistor
H4 Analog In 1,2	1	Gnd	Common	NA	NA
	2	AI1	Analog In 1		Driver_index_10V_DC-Pin Index 0
	3	AI2	Analog In 2		Driver_index_10V_DC-Pin Index 1
H5- I/O 1 to 5	1	Gnd	12 VDC	Brown	IO1-IO5 are general purpose Inputs/Outputs and are internally pulled up to 3.3 VDC via 10K resistor. Tyical use is for Dry contact inputs or low voltage outputs to control a connected LED indicator
	2	VEE + 12 V	I/O	Red	
	3	IO1	I/O	Orange	
	4	IO2	I/O	Yellow	
	5	IO3	I/O	Green	
	6	IO4	I/O	Blue	
	7	IO5	I/O	Violet	
H6- ST - Link V2 STM32 Programming Header	1	Gnd			Connect ST-Link V2 STM32 programmer to reprogram MCM34
	2	3.3VDC			
	3	SCI_Tx			
	4	SCI_Rx			
	5	NRST			
	6	SWO			
	7	SWCLK			
	8	SWDIO			
H7 -Alternate RS-485 FLN5 connection if using Part# 203-250 adapter	1	Gnd	Common	Brown	Connect 203-250 RS 485 adapter to H7 if using alternate RS-485 FLN5 connection. Registry 193:11:0:0 SerialPort must be set to 1 in the MCM34
	2	3.3 VDC	3.3VDC	Red	
	3	RS485 Tx	RS485 Tx	Orange	
	4	RS485 Rx	RS485 Rx	Yellow	
	5	TXE	TXE	Green	
	6	Not Used		Blue	
H8/ H9 - S5 Bus	1	Gnd	Common	Brown	
	2	12VEE+12 V	12VDC	Red	
	3	S5 Bus	Mult-drop communication bus	Orange	



MCM34 DIGITAL OUTPUT

STATUS LED BLINK PATTERNS

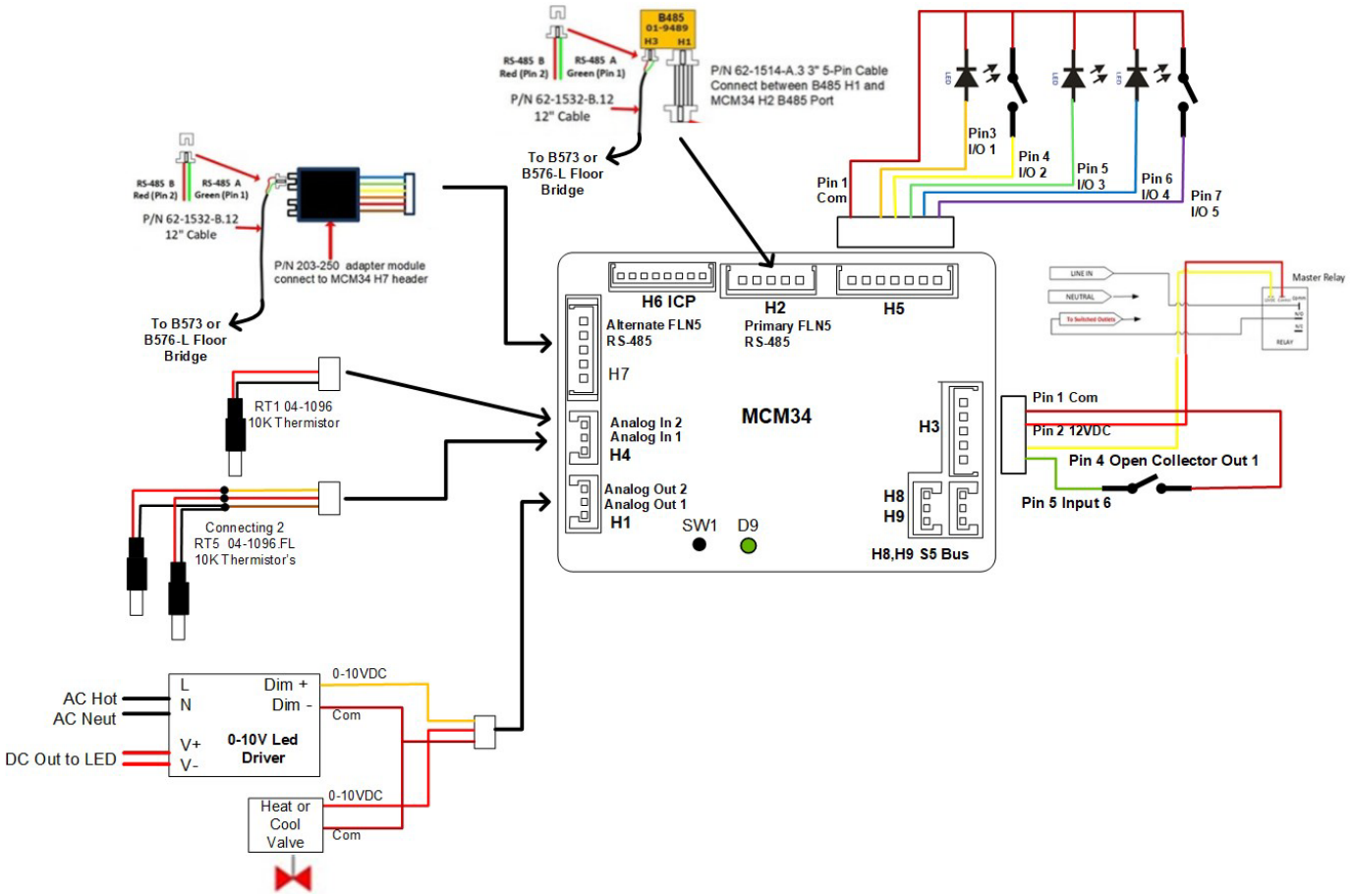
LED BEHAVIOUR	DESCRIPTION
Off	MCM34 is not powered
On for 1 second, Off for 1 second and repeating	The MCM34 is powered but is NOT connected to a B573 or B576-L Floor Bridge and has not received a "Central Status Broadcast" from the Room Gateway so it does not think the room is online/connected to the Inncom server.
A blink once per second and repeating	The MCM34 is powered and has received a "Central Status Broadcast" from the Room Gateway so it thinks the room is online/connected to the Inncom server.
3 blinks every 2 seconds	The MCM34 is connected to a B573 or B576-L Floor bridge and receiving FLN5 data, but it has has not received a "Central Status Broadcast" from the Inncom server so it does not think the room is online/connected to the Inncom server.
Steady Rapid Blink (3 blinks per second)	The MCM34 has received an Address or I/O Map teach command. Press the SW1 button on the MCM34 to accept the teach command.
Eight blinks 1/2 seconds apart, followed by a very rapid blink for 4 seconds	The MCM34 was just taught and accepted an Address or I/O Map and then Reset.
On for 1 second , followed by a very rapid blink for 4 seconds	The MCM34 just had power applied or was Reset , or the SW1 switch was pressed and the MCM34 sent a reverse bind command but never received a Bind/Configuration offer.

TEACH SWITCH (SW1)

With the MCM34 housing cover in place, you will need a paper clip or similar tool to insert into the hole next to the LED indicator to press SW1. The MCM34 can be reset by pressing and holding SW1 for more than 4 seconds. The following address teach instructions assumes the product installer has a working knowledge of the INNCOM system or is an INNCOM by Honeywell installer.

FUNCTIONS
SW1 is used for teaching the MCM34 a specific Address or function map.
Using the INNCOM thermostat service mode or PC configuration tool, send a "Device Address Teach" or "IOMap Teach" command to the MCM34.
Observe the MCM34 Diag LED change to a Fast Blink pattern (3 blinks per second), indicating it is ready to accept the new configuration.
Press SW1 on the MCM34.
The Diag LED will change to a medium blink pattern for 8 seconds, the MCM34 will Reset , and on startup rapidly blink the Diag LED for 4 seconds.
Listen for the thermostat to beep or look for an indication on the PC configuration tool confirming that the configuration was succesfully changed on the MCM34.

WIRING DIAGRAM



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