Remote Input Module

User Manual

UTC Fire & Security

A United Technologies Company

Remote Input Module

The Remote Input Module (RIM) provides the interface between the ACU Controller and additional alarm sensors. The RIM consists of the electronic circuit board and the screw terminal connector board connected together by a ribbon cable. The RIM can be installed in its own tampered enclosure.

Note: The RIM with backplate only is Product Number RIM16-E00.
The RIM with key locked enclosure is Product Number RIM16-E1L.

- When attaching a RIM to a Summit system, please refer to the *ACU3 Family Installation and Operation Guide* for the list of input and output assignments.
- *Surface Mount* (SMT) refers to a method of construction that allows the various module components to be mounted directly on the surface of the board rather than using the traditional *thru-hole* method.
- Each RIM provides 16 supervised inputs, 3 unsupervised inputs and 2 relay outputs (wet or dry contact relays Single Pole Double Throw).
- The Remote Input Module connects to the expansion port on the ACU in the upper addresses (4-7) only. Each expansion port can support four readers in addition to remote modules (RIM, RRM).
- Each of the 16 alarm inputs is supervised as 6-states, Alarm, Secure, Open, Shorted, Ground and Circuit Fault.

Auxiliary Power Supply for RIM

In many cases, the ACU can supply the power for the RIM. The exception is when using an ACURS with a plug-in transformer for its power supply. When the ACU can not supply power an auxiliary power supply must be used. When using an auxiliary power supply, make sure the 0V terminal on all remote modules and the ACU share a common ground.

The Remote Input Module requires 24 VDC (±15%).

WARNING Do not use the relays on the ACU Controller, Remote Reader Electronics (RRE), Remote Input Module (RIM) or Remote Relay Module (RRM) to switch any voltage above 30 volts. Failure to heed this WARNING can cause death, personal injury or damage to unit(s).

RS-485 Information

RS-485 is a differential voltage communication circuit. The Impedance is 120 ohms. End-of-line terminators are required on both ends of the communications path (See *Figure 1*). Multi-drop configurations are allowed with a maximum length of 4,000 feet (1,219 meters).

Stubs can be dropped, off the RS-485 cable, but the length of any stub cannot be longer than 10 feet (3 meters). Stubs can connect to ACU Controllers or remote modules (One-Stage reader, RRE, RIM or RRM). Stubs must not be terminated. **We strongly recommend that star configurations be avoided.** All remote modules have built-in terminators that are switch selectable.

RS-485 Wiring

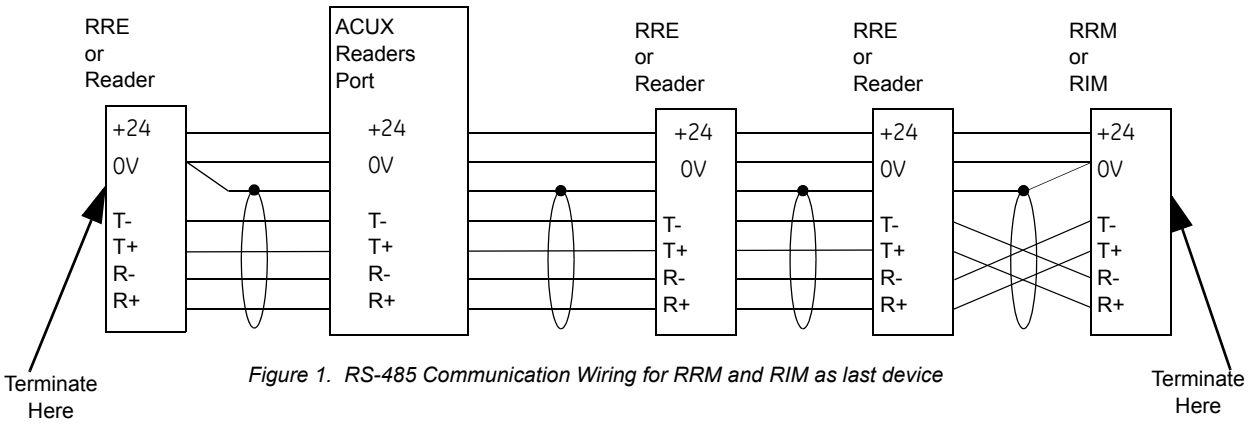

Figure 1. RS-485 Communication Wiring for RRM and RIM as last device

SMT RIM Board Layout

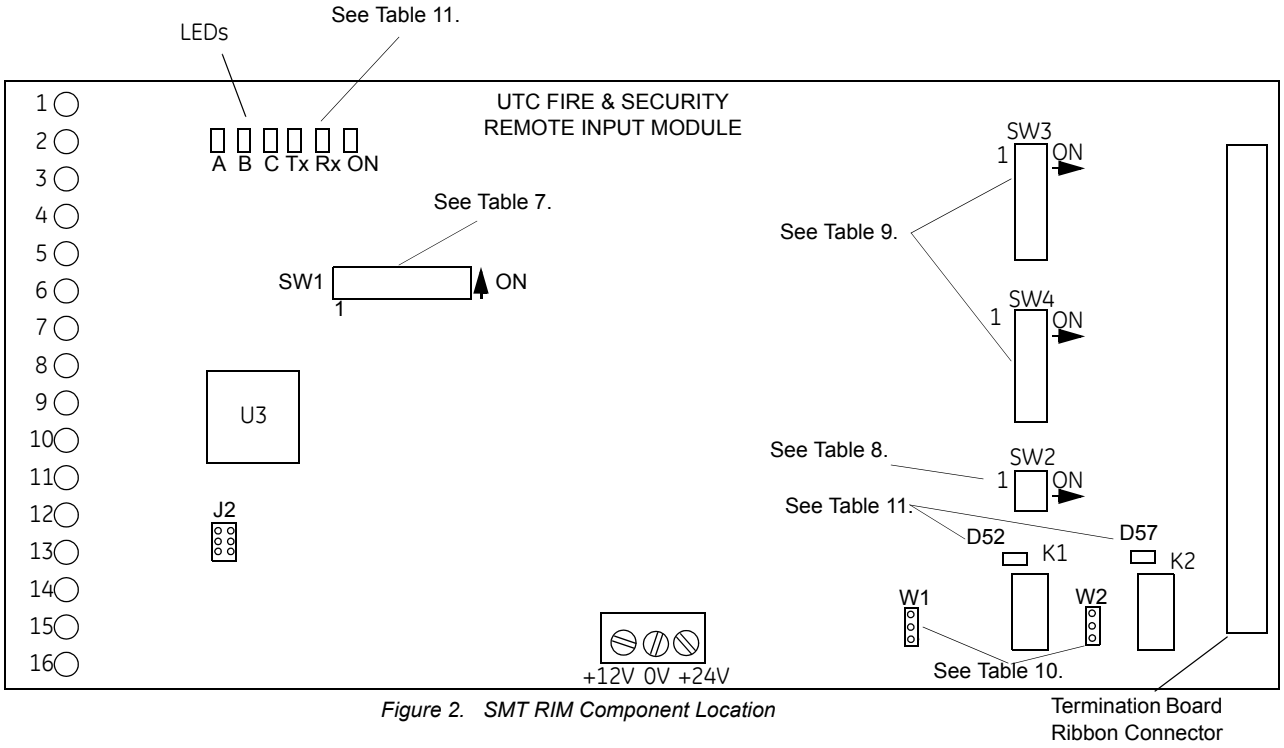

Figure 2. SMT RIM Component Location

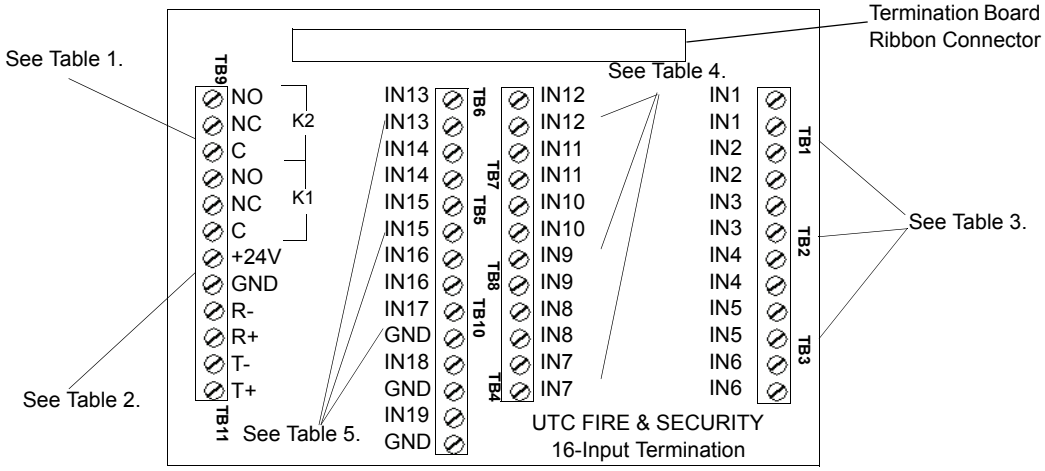

Figure 3. PIN Locations on the Terminal Board of the SMT RIM

Terminal Block Output Connections

Table 1. Wiring the Output Connections on the SMT Remote Input Module

TB	Pin No.	Term. Strip	Description
9	1	K2 N.O.	Aux Relay 2 Normally Open
9	2	K2 N.C.	Aux Relay 2 Normally Closed
9	3	K2 C.	Aux Relay 2 Common
9	4	K1 N.O.	Aux Relay 1 Normally Open
9	5	K1 N.C.	Aux Relay 1 Normally Closed
9	6	K1 C.	Aux Relay 1 Common

Table 2. Wiring the Communication Connections on the SMT Remote Input Module

TB	Pin No.	Term. Strip	Description
11	1	+24V	+ 24 Volts In
11	2	GND	0 V
11	3	R-	To ACU Expansion Port TX -
11	4	R+	To ACU Expansion Port TX+
11	5	T-	To ACU Expansion Port RX-
11	6	T+	To ACU Expansion Port RX+

Table 3. RIM Wiring Connections for TB1 - TB3

TB	Pin No.	Term. Strip	Description
1	1	IN1	Zone Input 1
1	2	IN1	Zone Input 1
1	3	IN2	Zone Input 2
1	4	IN2	Zone Input 2
2	1	IN3	Zone Input 3
2	2	IN3	Zone Input 3
2	3	IN4	Zone Input 4
2	4	IN4	Zone Input 4
3	1	IN5	Zone Input 5
3	2	IN5	Zone Input 5
3	3	IN6	Zone Input 6
3	4	IN6	Zone Input 6

Table 4. Connections for TB4, TB7 and TB8 on RIM

TB	Pin No.	Term. Strip	Description
7	1	IN12	Zone Input 12
7	2	IN12	Zone Input 12
7	3	IN11	Zone Input 11
7	4	IN11	Zone Input 11
8	1	IN10	Zone Input 10
8	2	IN10	Zone Input 10
8	3	IN9	Zone Input 9
8	4	IN9	Zone Input 9
4	1	IN8	Zone Input 8
4	2	IN8	Zone Input 8
4	3	IN7	Zone Input 7
4	4	IN7	Zone Input 7

Table 5. Connections for TB5, TB6, and TB10 on RIM

TB	Pin No.	Term. Strip	Description
6	1	IN13	Zone Input 13
6	2	IN13	Zone Input 13
6	3	IN14	Zone Input 14
6	4	IN14	Zone Input 14
5	1	IN15	Zone Input 15
5	2	IN15	Zone Input 15
5	3	IN16	Zone Input 16
5	4	IN16	Zone Input 16
10	1	IN17	Unsupervised Zone Input 17
10	2	GND	Ground
10	3	IN18	Unsupervised Zone Input 18
10	4	GND	Ground
10	5	IN19	Unsupervised Zone Input 19
10	6	GND	Ground

Input State Standard Resistance Ranges for Troubleshooting

When correctly wired, the input terminals should test with the default resistance listed in the table below. The end-of-line (EOL) resistor for the SECURE state is 1,000 Ohms as selected using the DIP switch settings. The End-Of-Line resistors must be located within the alarm zone sensor enclosure or the alarm zone circuit will be considered unsupervised.

When 1000 Ohms terminators are used, the sensors can be wired for either normally closed contacts or normally open contacts. In either case, the SECURE or inactive state should test at 1,000 ohms. A pair of 1 K ohm resistors, at the sensor end of each alarm circuit, ensures that the line resistance is typically 1 K ohm when the alarm is in the secure state.

Table 6. Input Zone Status By Resistance

Zone Input State	Sensor Circuit in Ohms Normally Closed	Sensor Circuit in Ohms Normally Open
Secure	1000	1000
Active	2000	500
Open	> 50,000	> 50,000
Short	< 50	< 50

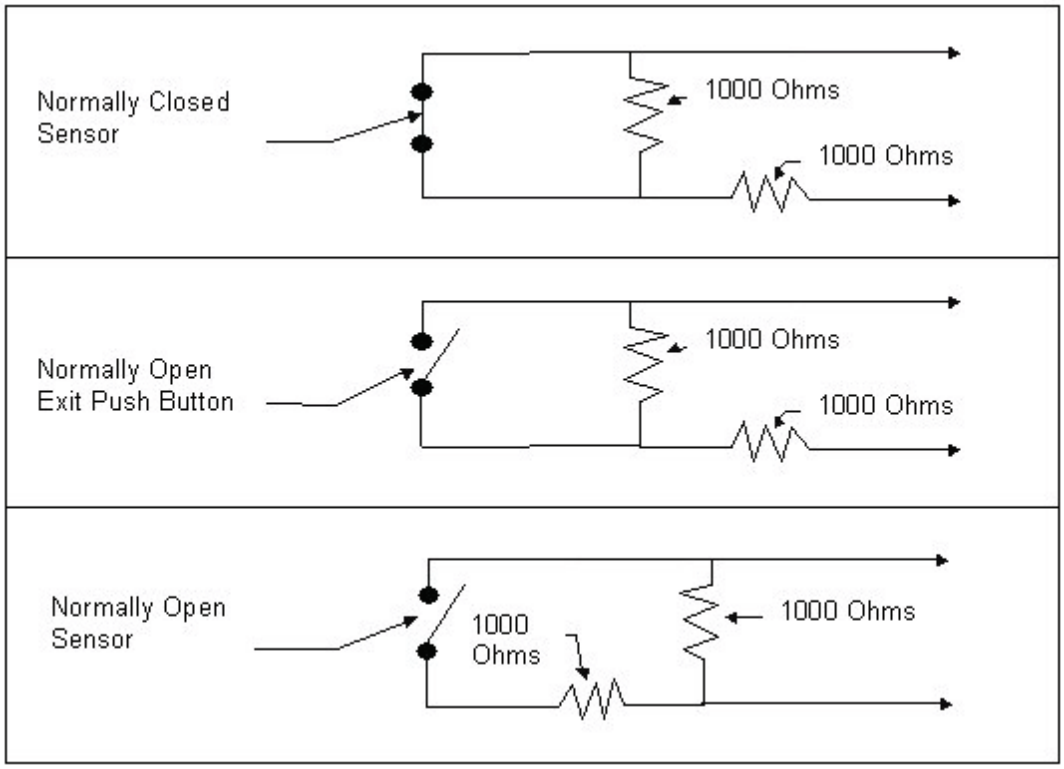

Figure 4. Zone Sensor 1000 Ohms Resistors

Setting the DIP Switches on the SMT RIM

SW1 Switch Settings

Note: The use of SW1-7 to provide the 200/10K termination option is available with firmware version 3.07 or later.

Table 7. RIM DIP Switch Settings

Switch Number				Description
SW1-1	SW1-2			Module address:
Off	Off			Addr 4
On	Off			Addr 5
Off	On			Addr 6
On	On			Addr 7
SW1-4				Alarm Latching:
On				Enables latching – Associated LEDs for zones 1—16 will latch on alarm. Zone 18 will reset cleared zone LEDs.
Off				Disables latching
SW1-3	SW1-5	SW1-6		Zone Termination:
Off	Off	Off		0.5K alarm, 1K safe, 2K alarm
On	Off	Off		75 ohms alarm, 150 safe, 300 alarm
Off	On	Off		1K safe, 3K alarm, 5—7K ground
On	On	Off		1K safe, 3K alarm
Off	Off	On		6.8K safe, 24K alarm
On	Off	On		1.5K safe, 3K alarm
Off	On	On		10K safe, 5K alarm
On	On	On		5K safe, 10K alarm
SW1-3	SW1-5	SW1-6	SW1-7	Zone Termination
Off	Off	Off	On	200 ohms safe, 10K alarm
				Switch 8 is a spare

SW2 Switch Settings for RS485 Termination

The 2-position DIP switch SW2 located on the RIM is used to terminate the RS485 communication when required.

Table 8. SMT RIM Switch SW2 for RS485 Termination

Switch SW2	Description
SW2-1 ON	Termination of Receive Pair
SW2-2 ON	Termination of Transmit Pair

SW3 and SW4 Switch Settings for Input Zone Termination

The 8-position DIP switch (SW3 and SW4) located on the RIM are used to terminate the unused RIM Inputs. The switch in ON position will terminate the zone with 1K resister.

Table 9. SMT RIM Switch SW3 and SW4 for Input Termination

Switch	Description
SW3-1	Zone 0 Termination
SW3-2	Zone 1 Termination
SW3-3	Zone 2 Termination
SW3-4	Zone 3 Termination
SW3-5	Zone 4 Termination
SW3-6	Zone 5 Termination
SW3-7	Zone 6 Termination
SW3-8	Zone 7 Termination
Switch	**Description**
SW4-1	Zone 8 Termination
SW4-2	Zone 9 Termination
SW4-3	Zone 10 Termination
SW4-4	Zone 11 Termination
SW4-5	Zone 12 Termination
SW4-6	Zone 13 Termination
SW4-7	Zone 14 Termination
SW4-8	Zone 15 Termination

Setting the Jumpers on the SMT RIM

Jumper W1 and W2 Settings

Jumpers W1 and W2 located on the RIM () are used to select if 24 VDC will be supplied by relays K1 and K2 on the RIM.

Table 10. SMT RIM Jumpers W1 and W2

Jumper	Description
W1	Jump pins 2 & 3 Relay K1 Dry
W1	Jump pins 1 & 2 Relay K1 energized with +24 V
W2	Jump pins 2 & 3 Relay K2 Dry
W2	Jump pins 1 & 2 Relay K2 energized with +24 V

Normal LED status on the SMT RIM

The LEDs on the Remote Input Module will light as follows:

Table 11. SMT RIM Normal LED Status

LED	Description
A	On when board is Communicating to ACU
B	Heart 1 Hz Flash - CPU is functioning correctly
C	Flashing when offline
Tx	Flashing when transmitting data to ACU
Rx	Flashing when receiving data from ACU
ON	ON when Power is applied to board
D57	ON when relay 2 is energized
D52	ON when relay 1 is energized
LEDs 1 - 16	Status of 16 Alarm points Green - Secure Red - Active Yellow - Trouble

Alarm Numbers on RIM

RIM Alarm Numbers for the Host PC

Table 12. RIM Alarm Numbers for the Host PC

Zone Input	Expansion Port 1 Address:				Expansion port 2 Address:			
	4	5	6	7	4	5	6	7
IN1	128	144	160	176	192	208	224	240
IN2	129	145	161	177	193	209	225	241
IN3	130	146	162	178	194	210	226	242
IN4	131	147	163	179	195	211	227	243
IN5	132	148	164	180	196	212	228	244
IN6	133	149	165	181	197	213	229	245
IN7	134	150	166	182	198	214	230	246
IN8	135	151	167	183	199	215	231	247
IN9	136	152	168	184	200	216	232	248
IN10	137	153	169	185	201	217	233	249
IN11	138	154	170	186	202	218	234	250
IN12	139	155	171	187	203	219	235	251
IN13	140	156	172	188	204	220	236	252
IN14	141	157	173	189	205	221	237	253
IN15	142	158	174	190	206	222	238	254
IN16	143	159	175	191	207	223	239	255
IN17	96	100	104	108	112	116	120	124
IN18	97	101	105	109	113	117	121	125
IN19	98	102	106	110	114	118	122	126
Offline	99	103	107	111	115	119	123	127

Relay Numbers on RIM

Table 13. RIM Relay Numbers for the Host PC

Relay Number	Expansion port 1 Address:				Expansion port 2 Address:			
	4	5	6	7	4	5	6	7
K1	32	34	36	38	40	42	44	46
K2	33	35	37	39	41	43	45	47

RIM Field Wiring Test

After making all connections and prior to connecting the ribbon cable to the RIM, the following tests should be made. Connections should already be completed at the ACU and external power supply if used.

Table 14. RIM Test Points and Voltages

From	To	Voltage	Tolerance
GND	+24V	+ 24 VDC	3.5 VDC
T+	T-	+ 4.0 VDC*	0.5 VDC
R+	R-	+ 2.5 VDC *	0.5 VDC
+24V	Bldg. Gnd.	24 VDC	3.5 VDC
GND	Bldg. Gnd.	0 VDC	0.5 VDC
T+	Bldg. Gnd.	Less than 6.0 VDC	N/A
T-	Bldg. Gnd.	Less than 6.0 VDC	N/A
R+	Bldg. Gnd.	Less than 6.0 VDC	N/A
R-	Bldg. Gnd.	Less than 6.0 VDC	N/A

* After the first expansion module is connected, these voltages will modulate due to data on the line. Most Digital Volt Meters should indicate about 2.0 VDC.

Power-Up Self Test on the RIM

The Remote Input Module should always be tested after installation. The indicators for the RIM are the red LEDs located on the component board. See *Figure 2* for the locations of these LEDs.

Note: The test will complete in less than 10 seconds after power-up.

Table 15. Power-up LED Indicators on the RIM

LED	Description
A	ON at power-up
B	ON RAM test successful
C	ON PROM tested and initialized
ON	ON when Power is applied
LEDs 1 - 16	All Green, then All Yellow, then All Red

Contacting technical support

For assistance with this product, refer to this document and any other documentation provided. If you still have questions, you may contact technical support during normal business hours (Monday through Friday, excluding holidays, between 8 a.m. and 7 p.m. Eastern Time).

Web site: www.utcfireandsecurity.com

Phone: 1 888 437 3287

Fax: 561 998 6224

Email: rs-bctsupport@fs.utc.com

Note: Be ready at the equipment before calling for technical support.