

WTB-860617 LOOP DETECTOR SERIES DESCRIPTION, OPERATION, AND INSTALLATION

1.0 GENERAL

1.01 The INS-860617 section provides description, installation and application information for the WTB-860617 loop current detector series.

1.02 This updated instruction sheet contains information on additional circuits to the 860617 series, including high sensitivity types.

2.0 DESCRIPTION

A. GENERAL INFORMATION

2.01 The WTB-860617-10/20/30 Standard Sensitivity Loop Current Detector series, provides a single set of isolated (dry), Form C (Normally open, normally closed, and common) relay contacts which will operate when loop current is detected in a conventional telephone circuit. The WTB-860617-40/50 High Sensitivity Loop Current Detector series, provides a single set of isolated (dry), Form A (Normally open, and common) relay contacts which will operate when loop current is detected in a conventional telephone circuit.

2.02 There are multiple versions of the basic standard sensitivity and high sensitivity units. Basically the standard sensitivity unit should be used in applications which require higher current Form C relay contacts, such as paging interrupt circuits. The standard sensitivity units should also be used in applications where bridging equipment will not be placed in front of the loop detector. Bridging voltages below approximately 6 volts will cause the Standard Sensitivity Detector to drop off. There are design advantages and disadvantages to this circuit action. The Standard Sensitivity 860617-10/20/30 are not recommended for use as A lead generators for 1A2 type Key systems for this reason. There are a number of other uses for these units with 1A2 and other types of equipment. (Refer to Application Note WTB-860617 for more detailed information)

The high sensitivity detector circuitry, in contrast, can be used in almost any type of bridged application. The high sensitivity unit will hold contact closure if the bridging voltage does not fall below 0.3VDC. This represents a very high sensitivity and allows up to five (5) normal telephone bridging loads on the same circuit. (Average load 400 ohms). The high sensitivity detector, however, has a Form A set of contacts with a low current rating. This limitation can be overcome by use of a slave relay and power supply. (Refer to Application Note WTB-860617).

Certain versions of both the high sensitivity and standard sensitivity detectors will detect DC loop current and AC ring current. Detection of AC ring current produces a contact flutter rather than a constant contact closure. Other limitations also apply to this ring detection. (See Electrical Specifications Section 2.08 WTB-860617-20)

A summary of the 860617 Loop Detector Series and brief description is tabulated on the following page. The stocked units have been standardized upon as they work in most applications.



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WTB 860617 SERIES LOOP DETECTORS REV 10/2003

Standard Sense/ Stocked Unit

WTB-860617-10 Standard Sensitivity/ 63ms Response/ Form C/ Page Interrupt

Special Order Standard Sense Versions

WTB-860617-20 Standard Sensitivity/ 25ms Response/ Form C/ Loop and Ring
WTB-860617-30 Standard Sensitivity/1200msResponse/ Form C/ Pol. Sensitive
WTB-860617-31 Standard Sensitivity/450ms Response/ Form C/ Pol. Sensitive
WTB-860617-32 Standard Sensitivity/250ms Response/ Form C/ Pol. Sensitive
WTB-860617-33 Standard Sensitivity/ 63ms Response/ Form C/ P.S./Pulse Rpt
WTB-860617-34 Standard Sensitivity/ 25ms Response/ Form C/ P.S./Ring Fltr

High Sense/ Stocked Unit

WTB-860617-40 High Sensitivity/ 120ms Response/ Form A/ IA2 A Lead Control

Special Order High Sense Versions

WTB-860617-43 High Sensitivity/ 63ms Response/ Form A/ Pulse Repeat
WTB-860617-44 High Sensitivity/ 25ms Response/ Form A/ Ring Flutter/w Loop
WTB-860617-50 High Sensitivity/ 250ms Response/ Form A/ 1A2 A Lead/Pol Sens
WTB-860617-53 High Sensitivity/ 63ms Response/ Form A/ Pulse Rpt/ Pol Sens
WTB-860617-54 High Sensitivity/ 25ms Response/ Form A/ Ring Fltr/ Pol Sen
WTB-860617-55 High Sensitivity/1200ms Response/ Form A/ Dial pulse filter

B. APPLICATIONS

2.03 The basic circuit function is to provide a dry set of relay closure contacts when conventional contacts, such as hook switch contacts, are unavailable or utilized for other functions. The circuits are series insertion type devices, telephone line powered, and can be ordered either polarity or non-polarity sensitive versions.

2.04 Typical applications include: Generation of A/A1 control contacts for 1A2 type Key Systems by equipment that does not have an available set of contacts. This often includes; answering machines, facsimile equipment, data modems, novelty telephones, etc. The High Sensitivity; 860617-40/50 series units are recommended for these applications.

Other applications include speaker cutout to prevent feedback in paging systems, and a wide variety of line status applications. The polarity sensitive versions can be used to detect line polarity reversal on Ground Start trunks and CPC (Calling Party Control) signals on standard trunks. These signals can be routed around PBX or similar equipment that is not equipped to pass them by use of the pulse repeat versions.

C. PHYSICAL DESCRIPTION

2.05 The basic WTB-860617-10 and related Standard Sensitivity units are small printed circuit board assemblies measuring 1.5"L X 1.2"W X .5"H. The units have five (5) telephone industry standard, spade lug receptacle terminals for interface connections. Five (5) 10" spade tip, color-coded, wires are supplied with the unit.

The basic WTB-860617-40 and related High Sensitivity versions are small printed circuit board assemblies measuring 1.75"L X 1.35"W X .45"H. The units have four (4) telephone industry standard, spade lug receptacle terminals for interface connections. Four (4) 10" spade tip, color-coded, wires are supplied with the unit.

2.06 The modular plug-in version of the circuits provide two (2) standard four conductor modular jacks and a three (3) position, quick connect, snap action terminal strip for the relay contacts. The housing case dimensions are 4.75"L X 2.75"W X 1.5"H. When ordering or

describing, these units have an "MC" suffix to denote the modular case, i.e.; CAI-860617-10MC or CAI-860617-20MC. All connections to these units are made via modular plug and snap connection terminal.

D. ELECTRICAL SPECIFICATIONS

2.07 WTB-860617-10 STANDARD LOOP DETECTOR - 63 MS RESPONSE

- Telephone Line Powered Device (24vdc to 56vdc Standard Loop)
- Passes Standard 105 VAC 20Hz Ring
- Non-Polarity Sensitive
- DC Insertion Voltage Drop: 6.8v Max
- AC Insertion Loss is less than 0.5db *Maximum loop current 150ma
- Must Operate Loop Current 15ma
- Must Drop Loop Current 3ma ' *Response Time: Any Pulse greater than 63 milliseconds (Ring Filtered @ 20Hz) will repeat 10PPS Dialing or 70ms CPC Signals

CONTACTS:

- One set Form C (Normally Open, Normally Closed, Common)
- rated at 1 Amp Resistive @ 28VDC
- 25W Average Audio Switching on Standard 25v Audio Page Lines
- External Arc Suppression and derating is required for reactive loads. .
- CONTACTS ARE INTENDED FOR CLASS II VOLTAGES ONLY

2.08 WTB-860617-20 STANDARD LOOP DETECTOR - 25 MS RESPONSE

- Telephone Line Powered Device (24vdc to 56vdc Standard Loop)
- Passes Standard 105 VAC 20Hz Ring
- Non-Polarity Sensitive
- DC Insertion Voltage Drop: 6.8v Max
- AC Insertion Loss is less than 0.5db ' *Maximum loop current 150ma
- Must Operate Loop Current 15ma *Must Drop Loop Current 3ma
- Response Time: Any Pulse greater than 25 milliseconds
- Repeats 10PPS or 20PPS dialing or 30ms CPC Signals
- Detects Ring Voltage and Flutters at Ring Frequency
- Requires minimum series ring load of 1.06 (Approx12K ohms) Practical Visual Flutter Limit reached at 30Hz Ring Freq.

CONTACTS:

- One set Form C (Normally Open, Normally Closed, Common) rated at 1 Amp Resistive @ 28VDC
- 25W Average Audio Switching on Standard 25v Audio Page Lines
- External Arc Suppression and derating is required for reactive loads.
- CONTACTS ARE INTENDED FOR CLASS II VOLTAGES ONLY

2.09 WTB-860617-30 STANDARD LOOP DETECTOR - Polarity Sensitive /Slow Release

- Telephone Line Powered Device (24vdc to 56vdc Standard Loop)
- Passes Standard 105 VAC 20Hz Ring
- Polarity Sensitive
- DC Insertion Voltage Drop: 6.8v Max
- AC Insertion Loss is less than 0.5db *Maximum loop current 150ma
- Must Operate Loop Current 15ma *Must Drop Loop Current 3ma
- Response Time: 860617-30 1200ms (STANDARD STOCK) 860617-31 450ms (Special Order) 860617-32 250ms (Special Order)
- 860617-33 63ms (Provides Pulse repeat w/Polarity)
- 860617-34 25ms (Provides Ring Flutter w/Polarity)

CONTACTS:

- One set Form C (Normally Open, Normally Closed, Common) rated at 1 Amp Resistive @ 28VDC
- 25W Average Audio Switching on Standard 25v Audio Page Lines
- External Arc Suppression and derating is required for reactive loads.
- CONTACTS ARE INTENDED FOR CLASS II VOLTAGES ONLY

2.10 WTB-860617-40 HIGH SENSITIVITY LOOP DETECTOR Non-Polarity Sensitive

- Telephone Line Powered Device (24vdc to 56vdc Standard Loop) *Passes Standard 105 VAC 20Hz Ring *Non-Polarity Sensitive
- DC Insertion Voltage Drop: 1.5v Max
- AC Insertion Loss is less than 0.5db *Maximum loop current 150ma
- Must Operate Loop Current 8ma *Must Drop Loop Current 2ma
- Response Time: 860617-40 120ms (STANDARD A LEAD)
- 860617-43 63ms (Provides Pulse Repeat)
- 860617-44 25ms (Provides Ring Flutter)

CONTACTS:

- One set Form A (Normally Open, Common) rated at 100ma Resistive @ 28VDC
- External Arc Suppression and derating is required for reactive loads.
- CONTACTS ARE INTENDED FOR CLASS II VOLTAGES ONLY

2.11 WTB-860617-50 HIGH SENSITIVITY LOOP DETECTOR Polarity Sensitive

- Telephone Line Powered Device (24vdc to 56vdc Standard Loop) *Passes Standard 105 VAC 20Hz Ring *Polarity Sensitive
- DC Insertion Voltage Drop: 1.5v Max
- AC Insertion Loss is less than 0.5db *Maximum loop current 150ma
- Must Operate Loop Current 8ma *Must Drop Loop Current 2ma
- Response Time: 860617-50 250ms (STANDARD A LEAD)
- 860617-53 63ms (Provides Pulse Repeat)
- 860617-54 25ms (Provides Ring Flutter)

CONTACTS:

- One set Form A (Normally Open, Common) rated at 100ma Resistive @ 28VDC
- External Arc Suppression and derating is required for reactive loads.
- CONTACTS ARE INTENDED FOR CLASS II VOLTAGES ONLY .

3.0 OPERATION

3.01 Operation of WTB-860617: The relay is activated when loop current in excess of 15ma or 8ma (High Sensitivity Version) is passed through the unit. The unit when activated will hold closure until the release current is reached or loop current is interrupted. Depending on the response time of the unit, dial pulses will be filtered or repeated. Response times of less than 100 ms will repeat dial pulses.

3.02 Operation of WTB-860617-20/34/44/and 54: These loop detectors respond to ring voltage as well as loop current. The units respond to ring voltage with a relay contact flutter. The rate of the flutter is a function of ringer load, applied ring voltage, and ring frequency. This flutter can provide visual indication of a ringing line as well as line status when used with a power supply and lamp. A steady contact closure is produced when the telephone goes off hook in response to the ring and D.C. loop current is passed through the unit.

4.0 INSTALLATION

4.01 Installation of the 860617-10 and related Standard Sensitivity circuit boards is illustrated in Figure 4-1. Connection to the unit is made via spade lug terminals as defined in the diagram. The connection terminals are identical for the WTB-860617-10, WTB-860617-20, and WTB-860617-30 series. The relay contact terminals are designated NO (Normally open), NC (Normally Closed), and C (Common):

4.02 Installation of the WTB- 860617-40 and related High Sensitivity circuit boards is illustrated in Figure 4-2. Connections to the units are made via spade lug terminals as defined in the diagram. The connection terminals are identical for the WTB-860617-40, and WTB-860617-50. series. The relay contact terminals are designated NO (Normally open), and C (Common). The NC (Normally Closed contact is not available on the High Sensitivity Versions.

CAUTION: NEVER USE THE RELAY CONTACTS ON THE 860617 UNITS TO DIRECTLY SWITCH 120VAC LINE VOLTAGE. ALWAYS USE A LOW VOLTAGE BUFFER CIRCUIT WHICH HAS BEEN RATED FOR THIS PURPOSE. FAILURE TO FOLLOW THIS PRECAUTION CAN EXPOSE INSTALLATION PERSONNEL TO HAZARDOUS VOLTAGE POTENTIAL. THE CONTACTS ARE INTENDED FOR CLASS II VOLTAGE OPERATION ONLY.

Higher voltage and current for operation of Klaxons or 120VAC lamps can be provided by utilizing a Solid State AC Relay such as the Grayhill 70S2-04-B-06-S and a Class II power supply in conjunction with the units relay contacts.

4.03 Installation of the WTB-860617-10MC and the CAI-860617-40MC is shown in Figure 4-3. The modular case may be wall mounted by using the double-stick tape provided with the units.

4.04 The relay contacts of the WTB-860617-10MC/20MC/30MC are factory optioned to the three terminal quick connect block on the modular case and are labeled C(Common) , NO(Normally Open), and NC(Normally Closed).

4.05 The relay contacts of the WTB-860617-40MC/50MC are factory optioned to the three terminal quick connect, on the first two positions, and are labeled C(Common) and NO(Normally Open). The High Sensitivity Detector Units provide a Form A contact closure only; The NC(Normally Closed contact is not available on the High Sensitivity Versions.

