



Interfaces Between Miscellaneous Control
and Status Functions of BellSouth (SPCS)
Central Office and Customer Premises
Equipment

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INTERFACES BETWEEN MISCELLANEOUS CONTROL AND STATUS FUNCTIONS OF BELLSOUTH SPCS CENTRAL OFFICES AND CUSTOMER PREMISES EQUIPMENT

1. GENERAL

This technical reference describes the interface between control and status leads as provided by BellSouth deployed SPCS (Stored Program Control System) central offices and customer premises equipment (CPE). These leads are used in ESSX[®] service and other service offerings to provide customer premise trunk control and service status functions in the pre-ISDN environment. As provisioned by BellSouth, the characteristics of the interfaces described are equivalent for any of the SPCS office types deployed to provide local exchange service.

2. SERVICES DESCRIPTION – CONTROL LEADS

Several services provided by BellSouth use loop closure of special control leads to allow customer premises equipment to activate features associated with the services being provided. These services include ESSX[®] service trunk make busy features, night service features, and other features where control of access to trunks, facilities or special services is desired. A two wire local loop is used to extend control leads from a central office control circuit (scan point) to the customer's premises where a key or other device can be operated to close the loop and exercise the feature. Typically one circuit is required for each trunk group or facility group to be made busy. The only options in the provision of this type of control is whether the central office provides battery for the loop or the customer premises equipment provides the battery.

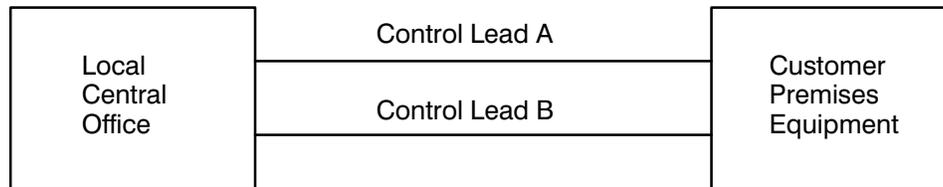
2.01 Control Interface Specification

Interface to a central office control circuit is made over a two wire local loop terminated in a modular connector or in a screw type connecting block at the customer premises. General description of two wire local loop characteristics is given in PUB 61100, "Description of the Analog Voiceband Interface Between the Bell System Local Exchange Lines and Terminal Equipment"[1]. Additional information on abnormal conditions that may occur in local loops is covered, in TR-EOP-000001, Issue 2 "Lightning and 60-Hz Disturbances at the Bell Operating Company Network Interface"[2].

The control circuit may be placed in one of two states by the customer premises equipment – idle (open) and busy (closed). The busy state is accomplished by electrical closure of the loop in the customer's equipment. Idle is indicated by leaving the circuit between the two local loop leads open to current flow. Either the central office will supply battery for the loop or the customer equipment can provide battery, but not both on the same circuit.

Typically the busy state is interpreted by the central office as an indication that access to the associated facility should be denied. In the idle state normal access is allowed. The specific interpretation of the control state depends on the service application.

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Two Wire Local Loop

Customer Premises Equipment Requirement Between A and B Leads	Circuit State	
With Central Office Providing Battery. Battery Source will be 42.75 – 52.5 volts.	Idle	Busy
	Open	Closure
	> 30K ohms	< 10 ohms
With Customer Equipment Providing Battery. Battery Source should be in the 42.75 – 52.5 volt range (nominal 48 volt).	Open	Loop closure to battery and ground supply.
	> 30K ohms	B lead must be positive with respect to A lead.

NOTE: Minimum loop current of 10 mA required to operate central office circuit (depends on loop resistance). Maximum current on short loops will be limited to 50 mA by the central office circuit.

FIGURE 1 – ARRANGEMENTS FOR CONTROL CIRCUITS

3. SERVICES DESCRIPTION – STATUS INDICATION

Discrete status indicators of various aspects of a customer's central office based services can be extended to the customer's premises where, typically, lamps or other devices can be provided to give a visual indication of this status. This type of indicator is used by ESSX[®] service call waiting features and to provide indication of a trunk or trunk group that is busy due to traffic or that is made busy by exercise of a control circuit described in section 2.

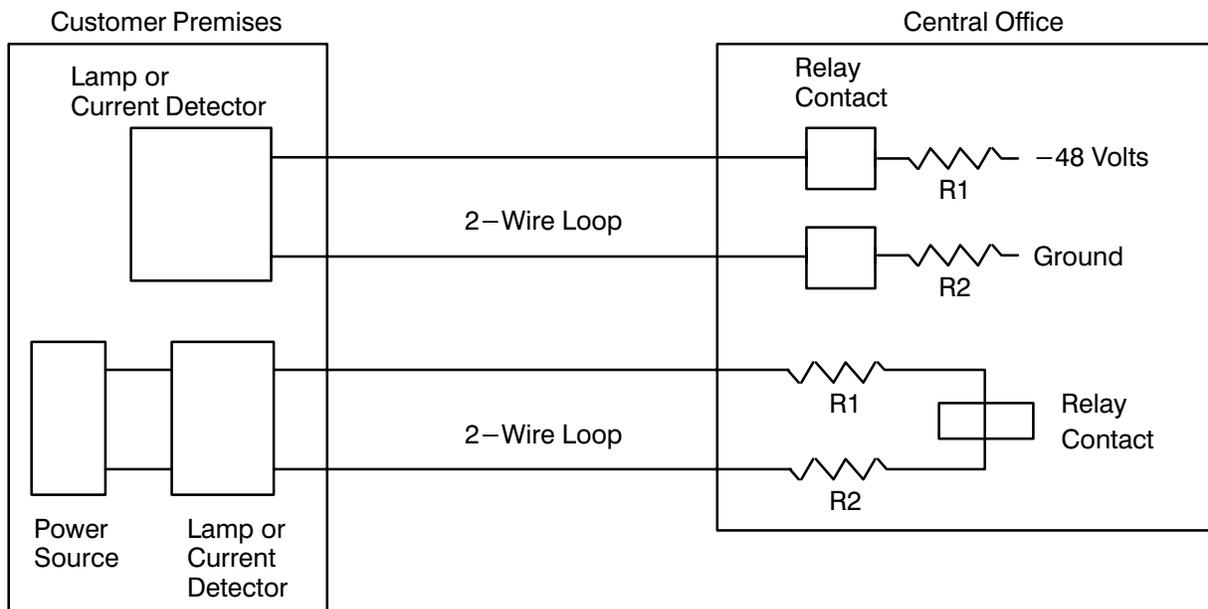
3.01 Status Indicator Interface Specification

To provide indicator features, a central office can be arranged to open or close a circuit attached to a two wire local loop resulting in current flow due to either a central office or customer premises based battery source. These circuits (signaling distribution points) are under control of the central office stored program which controls the overall operation and function of the switch. Customer premises equipment can be arranged to provide indication of the current flow in the loop, and thus the service status, by way of a lamp or other detection device.

Only two states are provided by a single circuit, i.e. the operation of the central office circuits and subsequent presence or absence of voltage is a two state indicator – the indicator is active or inactive. No intermediate status is conveyed over a single circuit. Multiple circuits can be provided to indicate the status of a service in varying grades of service. In this case, each circuit would be operated in turn to indicate which grade of service is currently being provided by the central office based facilities. The interpretation of the two states of an indicator circuit will depend on the service being provided and the customer application.

Central office indicator circuits are extended to customer premises over two wire local loops terminated in modular connectors or in screw type connecting blocks at the customer premises. The central office will provide nominal 48 volts DC (42.75 – 52.5 volts) fed through series resistors adjusted at installation to create a loop current flow of not more than 50 mA in the active state. Expected minimum current flow on long loops will be 10 mA into CPE loads of less than 900 ohms. In the inactive state, the central office equipment presents an open circuit of greater than 30,000 ohms to the local loop. Optionally, the customer premises equipment may be arranged to provide the power source. In this case the central office will not provide any power to the loop and will be adjusted to limit current flow to a maximum of 50 mA. Figure 2 depicts these two alternatives.

Use of a lamp in series with a control key on a control circuit of the type described in section 2 is not recommended. Such an arrangement would not provide positive indication of central office response to the loop closure. The indicator circuit described here is connected to a separate output circuit (signaling distribution point) which is under control of the stored program in the central office. Only this arrangement provides a positive indication of the activation of the intended control.



Notes:

1. 48 Volt Range = 42.75 – 52.50 volts.
2. R1 and R2 selected to limit current to 50 mA maximum.
3. Relay contacts may be normally open or normally closed, depending on the application.

FIGURE 2 – ARRANGEMENTS FOR STATUS INDICATOR CIRCUITS

REFERENCES

1. "Description of the Analog Voiceband Interface Between the Bell System Local Exchange Lines and Terminal Equipment," PUB 61100*, Bellcore, January 1983.
2. "Lightning and 60-Hz Disturbances at the Bell Operating Company Network Interface," TR-EOP-000001*, Bellcore, Issue 2, June 1987.

* If you wish to order these Bellcore documents, please call 201-699-5800.