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INTELIPORT® I
LINE POWERED 2W/4W DATA STATION TERMINATION WITH BATTERY BACK-UP OPERATION
MODEL SDS5496AB

(*CLEI™ Code: DSTNTJ03AA)

CONTENTS

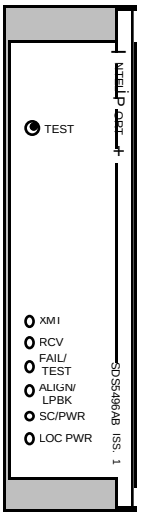
1. GENERAL

1.01 Teltrend's Line Powered Data Station Termination module, INTELIPORT I Model SDS5496AB, provides an interface between a 4-wire facility and a 600-ohm, 2W or 4W data modem. As a member of Teltrend's family of Intelligent Network Channel Terminating Equipment (INCTE), the SDS5496AB provides all the functions of a standard DST but with enhanced features. The unigue feature of the SDS5496AB is a battery-operated back-up circuit that provides power to the unit when simplex power is removed for maintenance testing. Other enhanced features include remote and automatic alignment capability, terminate and leave, choice of local or line power operation, and more. Additional features are listed in paragraph 1.03. The SDS5496AB is a microprocessor controlled unit. The integral microprocessor of INTELIPORT controls the intelligent functions of the unit while the oscillator circuit generates test tones. Both circuits allow comprehensive remote alignment and testing of the circuit when activated from a remote Serving Test Center (STC).

1.02 Whenever this practice is reissued or revised, the reason for reissue or revision will be stated in this paragraph.

1.03 Features of Teltrend's SDS5496AB are as follows:

- Terminate and Leave capability



CAUTION
This product incorporates static sensitive components. Proper electrostatic discharge procedures must be followed.

- Operates in either 2W or 4W data modem applications
- Microprocessor controlled
- Facility-side terminating impedance option (150, 600, 1200 Ohms); Equipment-side impedance is 600 Ohms, fixed
- Acknowledgement tone (alternating 1008/ 2808Hz) identifies unit as INTELIPORT when circuit is accessed for maintenance testing
- Front-panel TEST switch used to activate INTELIPORT's Wire Test mode for verifying station wiring or to activate INTELIPORT's Auto-Align feature from on-site
- Internal Sealing current circuit provides a termination for sealing current if sealing current is being supplied from the distant end and if the unit is being powered from a local power source

- Local Power: Operates from a local power source of -22 to -56Vdc at 20mA without battery, -30 to -56Vdc with battery, or from 20 to 28Vac at 40mA maximum; Also provides power query mode to determine power supply performance
- Line Power: Can be line powered from the simplex leads when local power is not available
- On-board battery provides power to the unit when simplex power is removed for testing
- Remote and automatic alignment capability
- Capable of aligning the circuit with respect to TLP (Transmission Level Point) or DLP (Data Level Point)
- Automatically adjusts amplitude response characteristics (up to 15.3dB) to meet C5 conditioning; Also provides equalizer query mode to determine equalizer's performance
- Automatically adjusts receive path for proper level coordination between facility and data modem
- Manual or 2713Hz tone-activated loopback
- Four tone auto-sweep or full-range transponder operation with quiet termination mode permits remote testing of noise and tone level measurements; Also provides 4-tone auto transponder over RCV IN port
- Escape to command mode feature (via 2604Hz); Escape to idle feature (via 2713Hz)
- Front-panel LEDs provide a quick visual indication to the status and operational mode of the unit
- Non-volatile memory circuit retains programmed information in the event of power loss
- Mounts in one position of a Teltrend Type-550 mounting assembly (Type-400 equivalent)
- Meets UL1459 requirements
- 7-year warranty

2. APPLICATIONS

2.01 INTELIPORT is used to interface a 4W facility with a 600-ohm, 2W or 4W data modem and is normally located on the same premises as the modem. INTELIPORT is an intelligent Data Station Termination that incorporates a microprocessor and oscillator circuit. Both circuits allow comprehensive remote testing of the circuit when activated from a manual or automated Serving Test Center (STC).

2.02 INTELIPORT incorporates a command mode from which all functions, except manual and tone-activated loopback and manual activation of the Auto-Align feature, are accessed. The command mode is the operational state in which INTELIPORT monitors its transmission ports for incoming frequencies and interprets these frequencies as commands to carry out specific functions. The command mode is activated from the STC by sending 2713Hz to INTELIPORT's RCV IN port for more than 30 seconds. After meeting this requirement, INTELIPORT responds with a steady 1008Hz tone at +5dBm (TLP) indicating command mode initiation.

2.03 While in command mode, the STC can access any one of INTELIPORT's intelligent functions which include: terminate and leave, toggling from TLP reference to DLP reference, activating the remote 3- or 4-tone alignment mode, initiating the automatic alignment sequence, activating a 4-tone auto-sweep transponder over the RCV IN port, or activating the quiet term/transponder mode of operation. In addition, the SDS5496AB provides the ability to query the equalizer and/or power supply status. The SDS5496AB also provides an escape feature that allows the test person to exit any mode and return to the command mode or return to idle. Details of each operating mode are discussed in Sections 5 and 6 of this document.

Dual Powering Feature

2.04 The dual powering feature of Teltrend's SDS5496AB allows the unit to operate from either the Serving Office sealing current source or from a local power source. This feature is especially useful when local power is either missing or has been interrupted for whatever reason. The SDS5496AB automatically switches over to operate via the Line Powering option if the local power ever becomes absent. The unit maintains full functionality during maintenance testing, regardless of the powering option used. When both local and line power is present, the SDS5496AB will always operate from local power as its first choice. In this case, the internal sealing current circuit provides a termination for sealing current when supplied from the distant end. **NOTE:** If the simplex power provided to the unit is removed, the on-board battery back-up circuit takes over to provide power to the unit.

3. OPTIONS

3.01 Teltrend's SDS5496AB contains two option switches that are used to condition the unit for proper operation for a given application. Refer to Figure 1 for

the location and description of each option. In addition, the SDS5496AB is equipped with a front-panel TEST switch. The TEST switch is used by the Installer to activate INTELIPORT's Wire Test mode for verifying station wiring after the unit is installed. The TEST switch can also be used to activate INTELIPORT's automatic alignment feature.

NOTE

The TEST switch, when used to activate INTELIPORT's automatic alignment feature, should be pressed only when instructed. Otherwise, pressing this switch at an inappropriate time may cause circuit disruption.

LED Status Indicators

3.02 INTELIPORT provides six front-panel LEDs. These LEDs provide a quick visual indication to INTELIPORT's operational status and current mode of operation. LEDs provided are for: Power (PWR) indicating either line or local source operation, Sealing Current (SC/PWR) operation, alignment or loopback (ALIGN/LPBK) mode of operation, fail or wire test mode (FAIL/TEST) mode of operation and transmit or receive (XMT/RCV) signaling status. Refer to Figure 1 for a summary of the LED functions.

4. INSTALLATION

4.01 Upon receipt of the equipment, visually inspect it for signs of damage. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company and to Teltrend.

CAUTION

This product incorporates static sensitive components. Proper electrostatic discharge procedures must be followed.

Installer Connections

4.02 When installing the unit in Teltrend's USA mounting (pre-wired Type 550 shelf), connections are made via 25-pair cables mating to the appropriate 25-pair cable connectors located on the rear of the mounting assembly. When installing the unit in Teltrend's un-wired Type 550 mounting (Type-400 equivalent), connections are made by wire-wrapping the appropriate leads from the facility and data modem to the proper pins of the appropriate 56-pin connector in which the module is to be installed. Pin identifications for proper wiring are listed in Table 1.

Power Requirements

4.03 Power to the SDS5496AB can be supplied from a local external power source or can be line powered via the simplex leads. When powered from an external source, the SDS5496AB will operate from a power source of 20 to 28Vac (24Vac, nominal) at 40mA, maximum or from -22 to -56Vdc (-48Vdc, nominal) at 20mA, maximum. From a line powered source, the SDS5496AB will operate via the simplex leads at 180mW. INTELIPORT provides a power supply query mode of operation that permits the STC to verify the status of the power supply. See Section 6, paragraph 6.12 for details on the power supply query mode of operation.

Table 1. Installer Connections

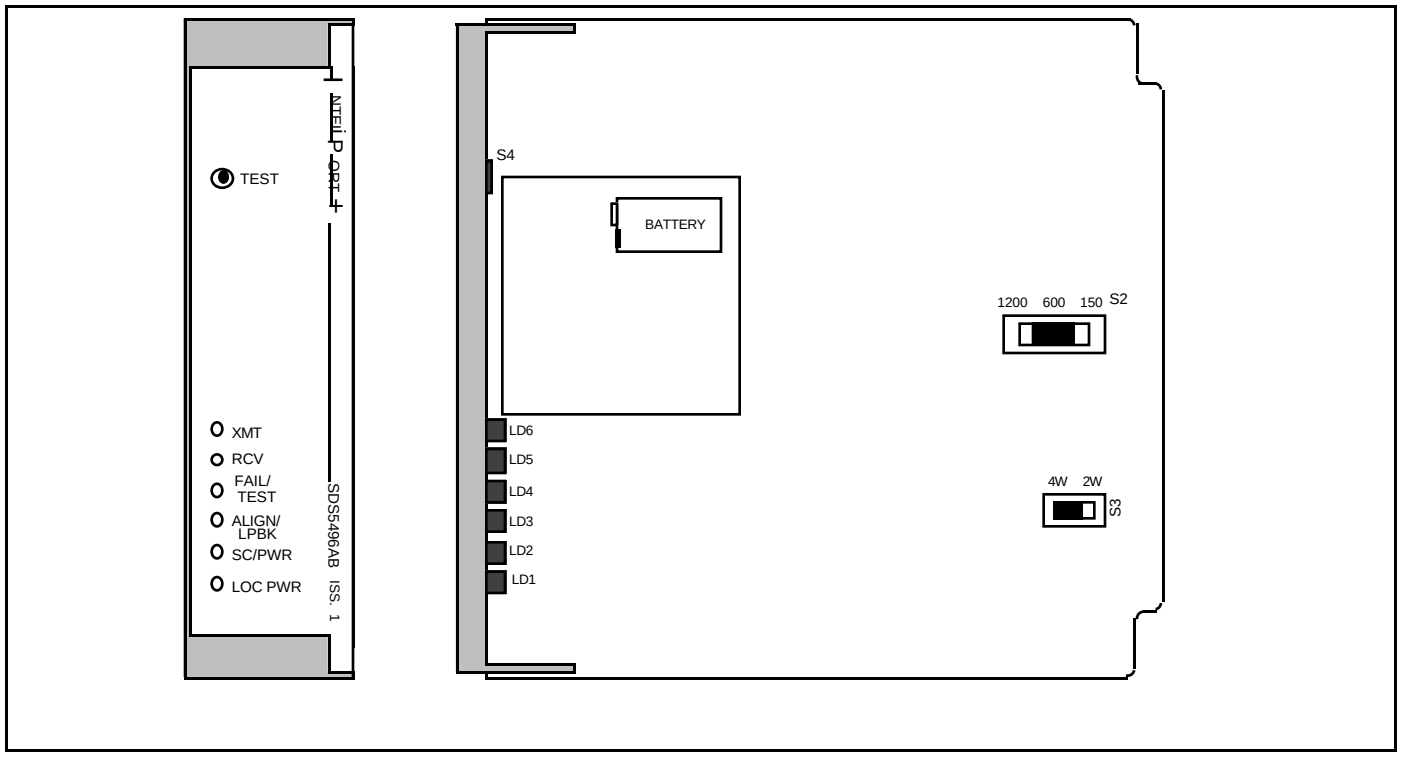
LEAD	DESIGNATIONS		PIN
RT	Receive In (Tip)		7
RR	Receive In (Ring)		13
TT	Transmit Out (Tip)	FACILITY	41
TR	Transmit Out (Ring)		47
SXR	Simplex Receive		9
SXT	Simplex Transmit		43
DRT	4W Receive Out (Tip)		5
DRR	4W Receive Out (Ring)		15
DTT	Transmit In/2W (Tip)		55
DTR	Transmit In/2W (Ring)	MODEM	49
TEK5	Data Set Disable		23
TEK6	Data Set Disable		21
MNLB	Manual Loopback		1
MLBG	Manual Loopback Ground	MISC.	19
PWR	Local Power		35
GND	Ground		17

Dual Powering Feature

4.04 The Power Detect circuit monitors both the local power source (pins 35 and 17) and the simplex leads (pins 9 and 43). If the unit is being powered from a local power source, the internal Sealing Current circuit provides a termination for sealing current when sealing current is being supplied from the distant end. If a local power source is not available, INTELIPORT will operate off the simplex current. If both local power and simplex powering is present, INTELIPORT will always operate off the local power source as its first choice. This way, if local power is ever interrupted, for whatever reason, the Power Detect circuit automatically switches the internal circuitry so INTELIPORT can operate off the line power source. Subsequently, when local power is restored, the internal circuitry automatically switches back to operate off the local power. **NOTE:** If the simplex power provided to the unit is removed, the on-board battery back-up circuit takes over to provide power to the unit.

Sealing Current/Simplex Powering

4.05 Sealing current is recommended on all metallic facilities to help prevent transmission path noise. Sealing current is a low-value dc current applied to the 4-wire dry cable pairs, on a simplex basis, to break down resistance which may build up at non-soldered cable splices. Continuous application of sealing current helps prevent degradation of transmission performance.



OPTION	POSITION	FUNCTION
S2	1200	Select when interfacing loaded cable
	600	Select when interfacing short nonloaded cable
	150	Select when interfacing long nonloaded cable
S3	2W	Select when interfacing 2W data modem equipment
	4W	Select when interfacing 4W data modem equipment
TEST S4		Press for <5 seconds to activate INTELIPORT's Wire Test mode Press for >5 seconds to activate the Auto-Align mode. Used to align two intelligent units

LEDs

PWR	When this LED is on it indicates local power is applied When this LED is off it may indicate local power is not present or unit is being line powered (see SC/PWR LED).
SC/ PWR	When this LED is on and the PWR LED is on it indicates sealing current is present and unit is being locally powered. If this LED is off it indicates sealing current is not present. **NOTE:** If the PWR LED is off and the SC LED is on it indicates the unit is being powered via the simplex leads (line).
ALIGN/ LPBK	When this LED is on steady it indicates unit is either in the command, alignment mode or transponder mode. When this LED is off it indicates the unit is in the idle state When this LED is flashing it indicates the unit is in the Loopback mode
FAIL/ TEST	When this LED is on steady it indicates a unit failure condition; Replace the unit When this LED is off it indicates the unit is in the idle state When this LED is flashing it indicates the unit is in the Wire Test mode
XMT	When this LED is on it indicates the unit is receiving data from the equipment side When this LED is off it indicates the unit is in the idle state
RCV	When this LED is on it indicates the unit is sending data to the equipment side When this LED is off it indicates the unit is in the idle state

Figure 1. INTELIPORT I (SDS5496AB) Option Diagram

4.06 The internal sealing current circuit provides a termination for sealing current when sealing current is supplied from the distant end. When local power and sealing current is present, both the PWR LED and the SC/PWR LED will light. When local power is not present but sealing current is present, the PWR LED will be off but the SC/PWR LED will be lit (on steady) indicating INTELIPORT is being powered via the simplex current.

Wiring Test Mode

4.07 Once the installer connections are complete and the option switches have been set to the required position, the unit can be installed. After installing the unit, the installer should activate INTELIPORT's Wire Test mode to verify installation and station wiring. Pressing the recessed, front-panel pushbutton TEST switch, for less than five seconds (see NOTE) causes 1008Hz to be applied to the RCV channel ports and to the XMT channel ports. Station wiring is verified by connecting a Transmission Test Set, with a built-in speaker, or other suitable listening device, to the receive and transmit channel pairs at the cable connection and demarcation points and listening for the appropriate tones. Refer to Table 2 for a summary of the tones output by INTELIPORT when operating in 2W or 4W applications.

NOTE

If the TEST switch is pressed and held for longer than five seconds, INTELIPORT recognizes this as a command to enter the AUTO-ALIGN sequence.

Table 2. Wire Test Mode Tones

PORT	4W	2W
RCV IN PORT (FACILITY SIDE)	Continuous 1008Hz	Continuous 1008Hz
XMT OUT PORT (FACILITY SIDE)	Interrupted 1008Hz	Interrupted 1008Hz
RCV OUT PORT (DEMARC SIDE)	Continuous 1008Hz	
XMT IN PORT (DEMARC SIDE)	Interrupted 1008Hz	Interrupted 1008Hz

In 2W applications, the RCV OUT port and XMT IN port utilize the same transmission pairs (T & R, pins 55 and 49).

4.08 After verifying the tones, press the TEST switch again to end the Wire Test mode. If the TEST switch is not pressed a second time, the Wire Test mode automatically times out one hour after initial activation. If desired, the STC can release the Wire Test mode remotely by sending 2713Hz, 10 to 60 minutes after initial activation.

5. FUNCTIONAL OPERATION

5.01 Refer to Figure 2, the SDS5496AB (Issue 1) Block Diagram, as needed while reading the following functional description.

Command Mode

5.02 INTELIPORT incorporates a command mode from which all functions, except manual and tone-activated loopback and manual activation of the Auto-Align feature, are accessed. The command mode is the operational state in which INTELIPORT monitors its transmission ports for incoming frequencies and interprets these frequencies as commands to carry out specific functions.

5.03 INTELIPORT's command mode is activated from the STC by sending 2713Hz to INTELIPORT's RCV IN port (pins 7 and 13) for more than 30 seconds*. Upon detecting 2713Hz for more than 30 seconds, INTELIPORT returns a steady 1008Hz tone at +5dBm (TLP) via the XMT OUT port (pins 41 and 47). The STC, upon receiving steady 1008Hz from INTELIPORT, removes the 2713Hz tone being sent. Command mode is activated. ***NOTE:** If 2713Hz is removed in less than 30 seconds, INTELIPORT enters loopback (see paragraph 6.02. Please also note that the command mode is equipped with a 5-minute timeout circuit. If no tone is sent to INTELIPORT within a five minute time frame, INTELIPORT drops out of the command mode and returns to idle.

5.04 While in command mode, the STC can access any one of INTELIPORT's intelligent functions which include: a terminate and leave feature, toggling from TLP reference to DLP reference, activating the remote 3- or 4-tone alignment mode, or initiating the automatic alignment sequence. Maintenance functions (see Section 6) include a Loopback mode of operation for verifying alignment levels, a RCV IN port 4-tone auto-sweep transponder mode, and a quiet term/transponder mode of operation for verifying noise and tone level measurements. In addition, the SDS5496AB provides the ability to query the equalizer and/or power supply status.

Terminate And Leave

5.05 INTELIPORT features a Terminate and Leave function that allows for pre-service conditioning. Pre-service conditioning means that INTELIPORT can be installed now but the circuit is not ready for service cut-over until a later date. In addition, Terminate and Leave can also be used as a maintenance function, in case of trouble, by disabling the circuit until a technician can be dispatched for troubleshooting.

Terminate And Leave Enable

5.06 While INTELIPORT is in the command mode, the test person activates the Terminate And Leave

BLOCK DIAGRAM

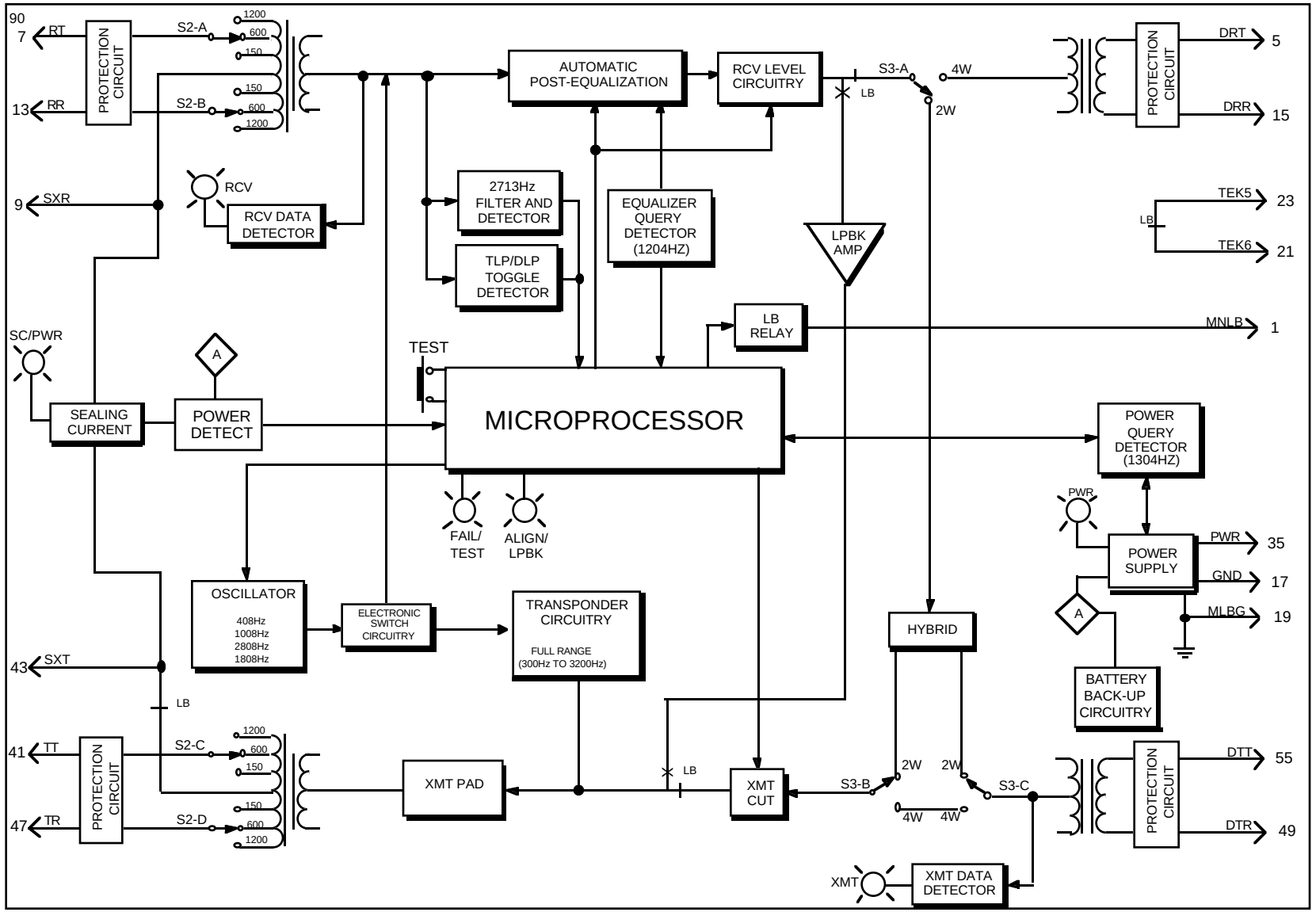


Figure 2. SDS5496AB (INTELIPORT I - Line Powered DST) Issue 1 Block Diagram

feature by sending a 2004Hz tone, for 20 seconds minimum, to INTELIPORT. Upon detecting 2004Hz, INTELIPORT's 1008Hz at +5dBm (TLP) command mode tone changes to 2008Hz at +5dBm (TLP). After five seconds, INTELIPORT returns to idle. When Terminate and Leave is activated, the front panel ALIGN/LPBK LED flashes at an approximate rate of one second off, 1/4 second on and the XMT path is cut.

Terminate And Leave Disable

5.07 To disable Terminate And Leave, the test person must reactivate the command mode, see paragraph 5.03. Upon accessing the command mode, the command mode tone, at this point, is 2008Hz at +5dBm (TLP). Upon receiving the 2008Hz tone from INTELIPORT, the test person sends 2004Hz for more than 20 seconds. Upon detecting 2004Hz, the 2008Hz tone changes back to 1008Hz. INTELIPORT is now in normal command mode and is ready to receive further instructions.

TLP/DLP Toggle

5.08 INTELIPORT is initially programmed to align and transpond at TLP (Transmission Level Point). This feature can, however, be changed to have the unit align and transpond at DLP (data level). Toggling from TLP to DLP is accomplished from the command mode by sending a 2804Hz tone. Upon detecting 2804Hz, INTELIPORT toggles to the DLP mode, corrects the internal circuitry to accommodate the change in reference levels, then returns to command mode. The toggling function can be verified by monitoring the 1008Hz output level for a change of 13dB. To return the circuit back to the TLP mode, the test person sends another 2804Hz while in command mode. **NOTE:** Each time INTELIPORT returns to idle, the TLP/DLP circuit automatically returns to the TLP mode. Therefore, whenever the command mode is re-accessed from an idle state and testing or alignment is to be done at data level, the test person must send 2804Hz to toggle the circuit to the DLP mode.

Alignment

5.09 The SDS5496AB features both remote (manual) and automatic alignment capability. Remote alignment is used to align the SDS5496AB. Remote alignment is activated from command mode by sending 1004Hz. Automatic alignment is used to automatically align INTELIPORT with the distant end. Auto align can be activated from command mode by sending 1804Hz or can be activated by pressing the front-panel TEST switch for more than five seconds. In either the remote or automatic alignment mode, INTELIPORT automatically adjusts the gain and equalization for proper level coordination between the facility and data modem equipment.

5.10 From command mode and before either Remote or Auto Align is activated, the test person must decide if alignment is to be done at TLP or DLP (see paragraph 5.08 for details). When programmed for TLP, INTELIPORT outputs its respective tones at +5dBm. When programmed for DLP, INTELIPORT outputs its respective tones at -8dBm. The operating levels for the SDS5496AB are given in Table 4. **NOTE:** Auto Align, when activated by pressing the TEST switch for more than five seconds, takes place at TLP only.

Table 4. Operating Levels

PORT	LEVELS (IN dBm)	
	TLP	DLP
RCV IN	+5 to -10	-8 to -23
RCV OUT	- 3	- 16
XMT IN	+13	0
XMT OUT	+ 5	- 8

Auto-Align

5.11 Upon detecting the command to enter the Auto Align mode (1804Hz or via the TEST switch being pressed), INTELIPORT sends 2913Hz to the distant end equipment for 60 seconds or until command mode tone is received from the distant end.

5.12 If a command mode tone is received from the distant end after sending 2913Hz, INTELIPORT removes its 2913Hz. At this point, INTELIPORT assumes the unit at the distant end is an intelligent 4W ETO and automatic alignment continues. If a command mode tone is not detected after sending 2913Hz, INTELIPORT drops the 2913Hz tone and sends 2713Hz. If a command mode tone is detected from the distant end at this point, INTELIPORT assumes an intelligent DST is at the other end and automatic alignment continues. **NOTE:** If no response is detected from the distant end after sending either 2913Hz or 2713Hz, INTELIPORT assumes the equipment at the other end is either a non-intelligent unit or the equipment is missing. In this case, INTELIPORT re-sends 2713Hz to the distant end and returns to idle. If no response is the result, the test person may perform a remote alignment of the SDS5496AB (see paragraph 5.15).

NOTE

Upon receiving command mode tone from the distant end and if INTELIPORT is programmed to align at DLP, INTELIPORT, after receiving command mode tone, sends 2808Hz to toggle the distant end's circuitry to the DLP mode.

5.13 With both ends set for auto align, tones of 1008Hz, 408Hz, 2808Hz, and 1808Hz are automatically sent and received between both ends. If the distant end is capable of aligning to four tones, the fourth tone (1808Hz) is sent. If the distant end is not capable of aligning to four tones, both ends automatically align to three tones. Gain and equalization is automatically set and alignment is complete. The automatic alignment sequence takes place in about three to five minutes.

NOTE

If aligning the SDS5496AB with an intelligent 4ETO (such as Teltrend's ISQ4386A), the ISQ returns either a ramp-up tone or a ramp-down tone after alignment. After receiving the ramping tone, INTELIPORT sends 1008Hz to the ISQ for five seconds. At this point, the ISQ returns to idle. After five seconds, INTELIPORT returns to idle. If aligning the SDS5496AB with another intelligent DST, the distant end returns either a ramp-up or ramp-down tone after alignment. After receiving the ramping tone, INTELIPORT sends 1008Hz to the distant end. At this point, INTELIPORT returns either a ramp-up tone or a ramp-down tone toward the tester. After the ramping tone, INTELIPORT re-sends 2713Hz to the distant end and returns to idle. The distant end, upon detecting 2713Hz from INTELIPORT, also returns to idle.

Ramp-Up/Ramp-Down Tone Sequence

5.14 Once the alignment sequence is done, INTELIPORT returns either a ramp-up tone or a ramp-down tone sequence. The ramping tone indicates whether or not the cable pair, on the facility-side, was equalized (see also Alignment Query operation in Section 6, paragraph 6.11). A ramp-up tone, consisting of a series of tones ranging from 308Hz to 3008Hz in ascending order, indicates alignment is within the specified requirements to meet C5 conditioning. A ramp-down tone, consisting of a series of tones ranging from 3008Hz to 308Hz in descending order, indicates alignment is not within the specified requirements to meet C5 conditioning. The ramp-down tone, however, does not necessarily mean the circuit did not align. The ramp-up or ramp-down tone sequence is applied for approximately 1.5 seconds with the last tone (3008Hz in the ramp-up tone sequence; 308Hz in the ramp-down tone sequence) being applied for approximately 15 seconds.

Remote (Manual) Alignment

5.15 Remote alignment is used to align the SDS5496AB. While in command mode (1008Hz present), the test person should record the level received at 1008Hz first. The test person then initiates a remote alignment by sending 1004Hz to INTELIPORT in response to INTELIPORT's 1008Hz tone.

5.16 Upon detecting 1004Hz, INTELIPORT returns 2808Hz. The test person should record the level received at 2808Hz, then send 2804Hz to INTELIPORT. Upon detecting 2804Hz, INTELIPORT returns 408Hz. The test person should record the level received at 408Hz, then send 404Hz to INTELIPORT. Upon detecting 404Hz, INTELIPORT returns 1808Hz for 60 seconds. The test person should record the level received at 1808Hz then has the option of aligning the circuit to 3 tones or to 4 tones. **NOTE:** The fourth tone in the alignment sequence (1808Hz) provides for a more accurate equalization when interfacing long section of loaded cable or a mixture of loaded and non-loaded cable.

3-Tone Alignment

5.17 If a 3-tone alignment is required, the test person can either ignore the 1808Hz tone from INTELIPORT or can send 1004Hz to INTELIPORT during the 60-second time frame. If the 1808Hz tone is ignored, INTELIPORT, after the 60-second time frame, drops the 1808Hz tone and aligns the circuit to the three tones. By sending 1004Hz in response to INTELIPORT's 1808Hz tone, within the 60-second time frame, the 60-second timer circuit is bypassed, the 1808Hz tone drops and INTELIPORT aligns the circuit to three tones. Upon completion, INTELIPORT returns either a ramp-up tone or a ramp-down tone (see paragraph 5.14) then enters loopback to permit verification of alignment levels (see paragraph 5.19).

4-Tone Alignment

5.18 If a 4-tone alignment is required, the test person sends 1804Hz, in response to INTELIPORT's 1808Hz tone, within the 60-second time frame. Upon detecting 1804Hz, INTELIPORT aligns to the four tones. Upon completion, INTELIPORT returns either a ramp-up tone or a ramp-down tone (see paragraph 5.14) then enters loopback to permit verification of alignment levels (see paragraph 5.19).

Loopback After Remote Alignment

5.19 While in loopback, the receive path is interconnected to the transmit path via a loopback amplifier. Loopback allows the test person to verify alignment settings and facility frequency response. The loopback circuit, when activated, automatically inserts 16dB of gain to provide an equal-level loopback condition. During loopback, the test person sends tones (404, 1004, 1804, and 2804Hz), one at a time, to INTELIPORT. The test person should verify/record the level of each tone as it is looped back by INTELIPORT.

Loopback Release

5.20 Loopback automatically releases 20 minutes after initial activation. If release is desired before the 20-minute time frame, the test person can send 2713Hz for 0.9 seconds, minimum. Loopback

releases upon detecting 2713Hz. The automatic timeout release feature ensures the transmission paths restore to normal operation if the 2713Hz tone is not sent.

6. TESTING AND MAINTENANCE

6.01 The SDS5496AB's testing and maintenance features include Loopback, Quiet Term/Transponder operation, Transponder operation over the RCV IN port, Alignment Query, and a Power Supply status Query. Loopback allows the STC to verify alignment setting established during alignment. The Quiet Term/Transponder allows the STC to perform noise and tone level measurements. The RCV IN port Transponder also allows the STC to perform noise and tone level measurements but over the RCV IN port. The Alignment Query allows the STC to verify whether alignment of the circuit is in or out of specifications to meet C5 conditioning requirements. The Power Supply status Query allows the STC to check if power to INTELIPORT was ever interrupted for whatever reason. The paragraphs in this section describe the operation of the testing and maintenance features.

Loopback - From Idle State

6.02 Loopback can be initiated any time the unit is idle by applying 2713Hz to INTELIPORT's RCV IN port for more than 2.5 seconds but less than 30 seconds*. INTELIPORT, upon detecting 2713Hz for more than 2.5 seconds, returns an alternating 1008/2808Hz tone indicating the circuit being accessed for maintenance testing as INTELIPORT, Teltrend's SDS5496AB intelligent 2W/4W Data Station Termination unit. ***NOTE:** If 2713Hz is present for more than 30 seconds, INTELIPORT enters the command mode.

6.03 While in loopback, the test person sends tones (404, 1004, 1804, and 2804Hz), one at a time, to INTELIPORT. The test person should verify/record the level of each tone as it is looped back by INTELIPORT. Loopback automatically releases 20 minutes after initial activation. If release is desired before the 20-minute time frame, send 2713Hz for 0.9 seconds, or longer. Loopback releases upon detecting 2713Hz.

Manual Loopback Activation

6.04 In addition to tone-activated loopback, the SDS5496AB' can be looped-back manually. Manual loopback is accomplished by placing a ground on the MNLB lead, pin 1. When loopback is activated manually, neither automatic timeout nor detection of 2713Hz will effect loopback release. Release of a manually activated loopback condition can only occur by removing the ground from pin 1.

Quiet Term/Transponder

6.05 INTELIPORT's Quiet Term/ Transponder mode of operation allows the test person to remotely conduct noise and tone level measurements. From the command mode, the Quiet Term/Transponder test mode is activated by sending 404Hz to INTELIPORT via the RCV IN port. Upon detecting 404Hz, INTELIPORT applies a quiet termination at the XMT IN port and isolates signals from the data modem. During quiet termination, the test person performs noise measurements at the RCV OUT port. Quiet termination remains in effect for 20 minutes or until another tone (i.e., to enter the transponder mode of operation, return to command mode, or return to idle) is sent. If no tone is sent to INTELIPORT with the 20-minute time frame, INTELIPORT, after 20 minutes of no activity, times out and returns to idle. Escape and return to command mode can also be done, at any time, by sending 2604Hz for more than five seconds. Escape and return to idle can also be done, at any time, by sending 2713Hz for more than five seconds.

Transponder Mode Of Operation

6.06 INTELIPORT features a 4-tone automatic sweep transponder mode and a full range transponder mode of operation. The 4-tone auto-sweep transponder allows for a quick tone level verification test over the XMT OUT port as INTELIPORT sweeps four tones. The full-range transponder mode allows for a more detailed tone level verification test over a range of frequencies from 300Hz to 3200Hz. Both transponder modes are activated from the quiet termination mode only.

4-Tone Auto-Sweep

6.07 To activate the 4-tone auto-sweep transponder, the test person sends 404Hz as the first tone while in quiet termination. Upon detecting this 404Hz, INTELIPORT sweeps the tones of 408Hz, 1008Hz, 1808Hz, and 2808Hz, each for 30 seconds, and applies the level of each tone over the XMT OUT port. After sending the last tone, INTELIPORT reapplies quiet termination and resets the 20-minute timer circuit.The 4-Tone Auto-sweep Transponder test can be re-started by re-sending 404Hz as the first tone while in quiet termination.

Full-Range Transponder

6.08 To activate the full-range transponder test mode, the test person sends any tone from 304Hz to 3204Hz (except 404Hz, 2604Hz and 2713Hz) as the first tone while in quiet termination. If 404Hz is detected as the first tone, INTELIPORT interprets this as a command to begin the 4-tone auto-sweep. However, 404Hz can be sent any time after the transponder test has begun. If a tone close to 2604Hz is detected at any time, INTELIPORT interprets this as a command to return to command mode. If 2713Hz tone is detected at any time, INTELIPORT interprets this as a command to return to idle.

6.09 During the full-range transponder mode, each tone sent to INTELIPORT should be in increments of 100Hz. As tone is received, INTELIPORT responds by sending a similar tone (but at a slight offset) for the same duration tone is received or for 15 seconds (whichever is longer). After removing a tone and if no other tone is sent by the test person, INTELIPORT reapplies quiet termination and resets the 20 minute timer circuit. If no tone is sent to INTELIPORT within the 20-minute time frame, INTELIPORT, after 20 minutes, times out and returns to idle. If release is desired before the 20-minute time frame, send 2604Hz for five seconds to return to command mode or 2713Hz for five seconds to return to idle.

RCV IN Port Transponder

6.10 In addition to the normal Quiet Term/Transponder mode of operation, INTELIPORT features a RCV IN port Transponder test mode. The RCV IN port Transponder test mode allows the test person to perform a quick level verification test as INTELIPORT sweeps four tones over the RCV IN port. To activate the RCV IN port transponder mode, the test person, while INTELIPORT is in the command mode, sends 504Hz, for greater than five seconds, subsequently removing the tone. Upon detecting 504Hz and its removal, INTELIPORT begins the test by sending 1008Hz for 60 seconds, followed by 60 seconds of quiet termination over the RCV IN port. After applying quiet termination for 60 seconds, INTELIPORT sweeps the tones of 408Hz, 1808Hz, and 2808Hz at 0dBm, each for 30 seconds. After sending the last tone of 2808Hz, INTELIPORT returns to command mode. The RCV IN port Transponder test can be re-started by re-sending and removing the 504Hz tone. **NOTE:** To bypass the 60-second quiet termination portion of the test and quickly enter the auto-sweep portion, send 1004Hz for five seconds (during quiet termination only). To abort this test and return to command mode, send 2604Hz (during quiet termination only) for longer than five seconds. To abort this test and return to idle, send 2713Hz for more than five seconds.

Alignment Query Mode

6.11 INTELIPORT features an Alignment Query mode that permits the test person to verify whether INTELIPORT returned a ramp-up tone sequence (indicating a good alignment) or a ramp-down tone sequence (indicating correct alignment could not be achieved). The Alignment Query mode is activated from the command mode by sending 1204Hz. Upon detecting 1204Hz, INTELIPORT returns either the ramp-up tone sequence or the ramp-down tone sequence, then returns to command mode. See Section 5, paragraph 5.14 for details on the ramp-up or ramp-down tone sequence.

Power Supply Query

6.12 As an additional maintenance feature, INTELIPORT provides a Power Supply Query mode of operation. The Power Supply Query mode allows the test person to verify the status of the power supply to determine if power was interrupted for whatever reason. The Power Supply Query mode is activated from the command mode by sending 1304Hz. Upon detecting 1304Hz, INTELIPORT returns either a ramp-up tone (308Hz to 3008Hz in ascending order, indicating power has not been interrupted since last alignment or query) or a ramp-down tone (3008Hz to 308Hz in descending order, indicating that an interruption in power occurred). After sending the ramp-up or ramp-down tone, INTELIPORT returns to command mode. To return to idle, the test person sends 2713Hz for more than five seconds.

Testing Procedures

6.13 The Testing and Alignment procedures, shown in Table 5, may be completed after the unit is installed and power applied. The procedures outlined are intended only to ascertain proper operation of the unit and, if problems should occur, to isolate those problems to the most probable area. These procedures are not designed to effect repairs or modifications. Tests beyond those outlined, or repairs made beyond replacing a faulty unit, are not recommended and may void the warranty.

6.14 If trouble is encountered, please be sure all installer connections have been made correctly and that the unit is properly seated and making a positive connection with the backplane connector of the mounting assembly. Please also check that the option switch settings are in the correct position for the application. After verifying the above conditions, retest the module. If trouble persists, replace the unit and repeat the procedures outlined. If technical assistance is required, contact Teltrend's Customer Service Department by calling:

1-800-TELTREN (1-800-835-8736) or, if busy,

(630) 377-1700 (8am to 5pm - Central Standard Time);

For after hours, weekends and Holidays, call our 24-hour number (630) 377-2255

Repair And Return Policy

6.15 If a unit needs repair, call Teltrend for a Return Material Authorization (RMA) number and return the defective unit, freight prepaid, along with a brief description of the problem, to:

Teltrend Inc.
620 Stetson Ave.
St. Charles, Illinois 60174
ATTN: Repair & Return Dept.

6.16 As specified in our warranty, Teltrend will repair and return the unit at no charge to the customer providing the warranty of the unit has not expired. If an out-of-service situation exists, a replacement unit can be obtained; however, a purchase order number will be required to ensure return of the replacement unit.

7. SPECIFICATIONS

Impedance: Facility-side, selectable for 150, 600 or 1200 Ohms; Equipment-side, (2W or 4W) 600 Ohms, fixed

RCV Level Range: Input, -10 to +5dBm (TLP), -23 to -8dBm (DLP); Output, -3dBm (TLP), -16dBm (DLP), ±0.5dB

XMT Level Range: Input, +13dBm (TLP), 0dBm (DLP); Output, +5dBm (TLP), -8dBm (DLP), ±0.5dB

Meets UL1459 requirements

Wire Test Mode: Activated by pressing front-panel TEST switch (<5 sec.). When pressed in this manner, 1008Hz tone is applied to transmission pairs (see Table 2, page 4); **Release,** TEST switch pressed second time, releases automatically after 1-hour, or can be released from STC, 10 to 60 minutes after activation (**NOTE:** If switch pressed for >5 sec., INTELIPORT enters AUTO-ALIGN)

Escape Feature: Return to command mode (from any mode) by sending 2604Hz (>5 sec.); Return to idle (from any mode) by sending 2713Hz (>5 sec.)

Command Mode: Activated from STC by sending 2713Hz for more than 30 sec. INTELIPORT returns steady 1008Hz indicating command mode initiation; **Release,** 2713Hz (>5 sec.), or 5-minute timeout if no tone sent (**NOTE:** If 2713Hz is removed in <30 sec., INTELIPORT enters loopback)

Terminate And Leave: Activated from command mode by sending 2004Hz (>20 sec.). 1008Hz command mode tone changes to 2008Hz. After 5 sec., unit returns to idle; Deactivated by re-accessing command mode and sending 2004Hz (>20 sec.) 2008Hz command mode tone changes back to 1008Hz at +5dBm (TLP)

TLP/DLP: Unit is factory programmed to align at TLP but can be programmed to align at data level (DLP). To toggle, send 2804Hz while in command mode. (**NOTE:** Circuit automatically returns to TLP whenever unit returns to idle)

Remote (Manual) Alignment: Activated from command mode by sending 1004Hz in response to INTELIPORT's 1008Hz. Tones between INTELIPORT and the tester are repeated with frequencies of 2804, 404 and 1804Hz in response to INTELIPORT's 2808, 408 and 1808Hz, respectively.

Auto-Alignment: Activated from command mode via 1804Hz. Can also be activated via TEST switch being pressed and held for >5 sec. When activated from command mode, alignment at TLP or DLP can take place. When activated via TEST switch, alignment at TLP only takes place; **Release,** automatically returns to idle upon completion (Auto-Align takes about 3 to 5 minutes to complete)

Equalization: Provides receive channel amplitude equalization (up to 15.3dB, re: 1004Hz) for 3- or 4-tone alignment to meet C5 conditioning requirements; Also provides equalizer query mode (activated from command mode via 1204Hz) to determine equalizer's performance

Loopback: Tone-activated from idle state via 2713Hz (±7Hz) for >2.5 sec. but <30 sec. followed by removal of tone; ±37Hz must not operate. If tone applied for >30 sec., INTELIPORT enters command mode; Manual Loopback, activated by grounding pin 1 (MNLB lead); **Release,** if tone activated, by sending 2713Hz (>0.9 sec.) or 20-minute automatic timeout release feature; If manually activated, removal of ground only

Loopback Transmission Level: Automatically inserts up to 16dB of gain to provide equal-level loopback condition

Loopback Level: -24dBm (typically -30) to -3dBm

Quiet Termination Mode: Activated from command mode via 404Hz. INTELIPORT applies quiet termination at XMT IN port and sets 20 minute timer. STC performs noise measurements; **Release:** Return to command mode, 2604Hz (>5 sec.); Return to Idle, 2713Hz (>5 sec.) or 20-minute automatic timeout if no tone sent

4-Tone Auto-Sweep Transponder Operation: Activated from quiet termination mode only via 404Hz as first tone. INTELIPORT sweeps tones of 408, 1008, 1808, and 2808Hz, each for 30 sec., then reapplies quiet termination and resets 20-minute timer; **Release:** Return to command mode, 2604Hz (>5 sec.); Return to Idle, 2713Hz (>5 sec.) or 20-minute automatic timeout if no tone sent

Full-Range Transponder Operation: Activated from quiet termination mode only via any tone from 304Hz to 3204Hz (except 400, 2600 and 2700Hz - see paragraph 6.08 also). INTELIPORT responds by sending a similar tone (but at slight offset) for same duration tone is received or for 15 sec. (whichever is longer). Tones sent from the STC should be in increments of 100Hz. Upon completion and if no other tone is sent from the STC, INTELIPORT reapplies quiet termination and resets the 20-minute timer; **Release:** Return to command mode, 2604Hz (>5 sec.); Return to Idle, 2713Hz (>5 sec.) or 20-minute automatic timeout if no tone sent

RCV IN Port 4-Tone Auto-Sweep Transponder: Activated from command mode via 504Hz. INTELIPORT sends 60 sec. of 1008Hz, 60 sec. of quiet term, then sweeps tones of 408, 1808, and 2808Hz at 0dBm (@ 600 Ohms), each for 30 sec., then returns to command mode; Return to idle, 2713Hz for >5 sec.

Idle Noise: 17dBrnC0, max.

Transhybrid Loss: > 30dB, minimum; 45dB typical

Frequency Response: Receive path, meets C5 conditioning

Longitudinal Balance: > 58dB at 200 to 3000Hz

Harmonic Distortion: <-60dB at 200 to 3000Hz

Local Power: -22 to -56Vdc (-48Vdc, nominal) at 20mA, maximum without battery backup, -30 to -56Vdc with battery backup (-30Vdc minimum required for battery trickle charge); or 20 to 28Vac (24Vac, nominal) at 40mA, maximum.

Simplex Power: operates via simplex leads at less than 180mW; Also provides a battery back-up circuit that provides power to the unit when simplex power is removed for maintenance testing. When battery back-up is not in use, the battery is under trickle charge control from the simplex power

NOTE: Both power options feature a power query mode (activated from command mode via 1304Hz) to determine power supply's performance

Sealing Current: When unit is locally powered, sealing current circuit provides a termination for sealing current when supplied from distant end

Operating Environment: Temperature, 32° to 120° F (0 to 50°C); Humidity, 0 to 95% (no condensation)

Mounting: Teltrend's DAS290 for single module installation or in one position of a Teltrend Type 550 (Type 400 equivalent) mounting

Unit Dimensions: Height, 5.58 in. (14.17cm); width, 1.42 in. (3.6cm); depth, 5.9 in. (15cm)

Unit Weight: Approx. 1.6 lbs. (0.72kg)

Battery: PLAINVIEW Part # PB1605

ORDERING INFORMATION

Order in accordance with the following:

5496AB SDS - INTELIPORT I - Line Powered DST with battery back-up circuitry

Table 5. Testing And Alignment Procedures

STEP	ACTION
1.	**INSTALLER'S PROCEDURES** Set all option switches as required per Circuit Layout Record (CLR) card. Install unit and apply power. If unit is being locally powered, verify PWR LED on, SC/PWR LED on (if applicable), and ALIGN/LPBK and FAIL/TEST LEDs off. If unit is being powered via the simplex leads, verify PWR LED off, SC/PWR LED on, and ALIGN/LPBK and FAIL/TEST LEDs off. **NOTE:** If FAIL/TEST LED is on steady, replace unit and repeat Step 1. If FAIL/TEST LED is flashing, momentarily press the recessed front-panel TEST switch.
2.	**Wire Test Mode - CAUTION** INTELIPORT places 1008Hz on the transmission pairs when Wire Test mode is activated. Be sure INTELIPORT is not connected to an in-service circuit where this tone may cause interference Momentarily press the front-panel TEST switch (less than five seconds). the TEST switch is pressed for longer than five seconds, INTELIPORT enters the AUTO-ALIGN mode. Verify FAIL/TEST LED flashing. Connect TMS with built-in speaker, or other suitable listening device, to: **PORT** — **4W APPLICATIONS** — **2W APPLICATIONS** RCV IN pair at the cable entry point — Continuous 1008Hz — Continuous 1008Hz XMT OUT pair at cable entry point — Interrupted 1008Hz — Interrupted 1008Hz RCV OUT pair at demarcation point — Continuous 1008Hz XMT IN pair at demarcation point — Interrupted 1008Hz — Interrupted 1008Hz When tones are verified, press TEST switch again to end Wire Test mode. Verify FAIL/TEST LED off. If TEST switch is not pressed a second time, Wire Test mode automatically times out one hour after initial activation. If desired, STC can release the Wire Test mode by sending 2713Hz, 10 to 60 minutes after initial activation. **NOTE:** In 2W applications RCV and XMT IN port utilize same transmission pairs (T & R, pins 55 and 49).
3.	**TEST CENTER'S PROCEDURES** **COMMAND MODE -** Send 2713Hz (>30 seconds) to INTELIPORT via RCV IN port (pins 7 and 13). INTELIPORT returns 1008Hz. STC removes 2713Hz. Command mode initiated. **NOTE:** If 2713Hz is removed in less than 30 seconds, INTELIPORT enters loopback.
4.	**TERMINATE AND LEAVE (Enable/Disable) -** To be performed only if circuit is not ready to be cut-over at this time **To activate**, send 2004Hz (>20 sec.) to INTELIPORT while in command mode. Upon detecting 2004Hz, INTELIPORT's 1008Hz at +5dBm (TLP) command mode tone changes to 2008Hz at +5dBm (TLP). After five seconds, INTELIPORT returns to idle [The front panel ALIGN/LPBK LED flashes at an approximate rate of one second off, 1/4 second on also indicating the Terminate and Leave is activated]. **To disable**, re-enter command mode. Command mode tone, at this point, is 2008Hz at +5dBm (TLP). Test person then sends 2004Hz (>20 sec.). Upon detecting 2004Hz, 2008Hz command mode tone changes back to 1008Hz. INTELIPORT is ready to receive further instructions.
5.	**TLP/DLP (Perform this step only if aligning at DLP) -** INTELIPORT is initially set to align at TLP From command mode, send 2804Hz. INTELIPORT toggles to DLP mode, then returns to command mode. Toggling is verified by monitoring 1008Hz output level for a change of 13dB. To toggle back to TLP, send another 2804Hz while in command mode. **NOTE:** Circuit automatically returns to TLP mode whenever unit returns to idle. Therefore, when aligning at data level, unit must be reset to DLP mode.
6.	**Remote (Manual) Alignment** From command mode (1008Hz present), record level received, then send 1004Hz to INTELIPORT. INTELIPORT sends 2808Hz. Record level received, then send 2804Hz to INTELIPORT. INTELIPORT sends 408Hz. Record level received, then send 404Hz to INTELIPORT. INTELIPORT sends 1808Hz for 60 seconds. Record level received. STC has option: **4-Tone Alignment** **-Send 1804Hz** within 60 seconds. INTELIPORT aligns to 4 tones, sends ramp-up/ramp-down tone, then enters loopback. **3-Tone Alignment** **- Ignore 1804Hz** request. 1808Hz tone times out after 60 seconds. INTELIPORT aligns to 3 tones, sends ramp-up/ramp-down tone, then enters loopback. Please note that when aligning to 3 tones is preferred, the 60-second timer circuit can be bypassed by sending 1004Hz.

CONTINUED

Table 5. Testing And Alignment Procedures Continued

STEP	ACTION
7.	**Loopback** While in loopback, STC sends tones (404, 1004, 1804 and 2804Hz), one at a time, to INTELIPORT. The STC should record the level of each tone as it is looped back by INTELIPORT. **Release from loopback.** Automatically releases after 20 minutes. INTELIPORT returns to idle. If release is desired before the 20-minute time frame, send 2713Hz for >0.9 sec. INTELIPORT returns to idle upon detecting 2713Hz.
8.	**Auto-Align (**Completion time is three to five minutes) From command mode, perform Step 5 (if required), then send 1804Hz to INTELIPORT. INTELIPORT first sends 2913Hz to Distant end for 60 seconds or until command mode tone is received.If a command mode tone is received (i.e., distant end is an intelligent 4W ETO), 2913Hz is removed and alignment continues. If no response to 2913Hz is detected, INTELIPORT sends 2713Hz for 60 seconds or until command mode tone is received. If a command mode tone is received from distant end at this point (i.e., another DST is in place), automatic alignment continues. (**NOTE:** After receiving command mode tone from distant end and if INTELIPORT is programmed to align at DLP, INTELIPORT sends 2808Hz to make distant end compatible). **NOTE:** If no response from either 2913Hz or 2713Hz is detected, INTELIPORT re-sends 2713Hz to distant end and returns to idle. In this case, test person may want to perform remote alignment (see Step 6). When both ends are set, tones are automatically sent and received between both ends. Upon completion Gain and equalization is automatically set. When aligning INTELIPORT with an intelligent 4ETO, the distant end returns either a ramp-up tone or a ramp-down tone. After receiving the ramping tone, INTELIPORT sends 1008Hz and returns to idle. Alignment is complete. When aligning INTELIPORT with another intelligent DST, the distant end returns either a ramp-up tone or ramp-down tone. After receiving the ramping tone, INTELIPORT returns either a ramp-up or ramp-down tone. After five seconds, INTELIPORT sends 2713Hz to distant end and returns to idle. Alignment is complete. (See paragraph 5.16 for description of ramp-up/ramp-down tones).
9.	**Quiet Term/Transponder Operation** From command mode, send 404Hz. INTELIPORT applies quiet termination at the XMT IN port and sets 20-minute timer. STC performs noise measurements. **NOTE:** Quiet termination remains in effect for 20 minutes or until another tone (i.e., enter 4-tone auto or full-range transponder, or exit quiet termination and return to command mode) is sent. If no tone is sent within 20-minute time frame, INTELIPORT, after 20 minutes, times out and returns to idle. From quiet termination, STC has option: **Enter 4-Tone Auto-Sweep Transponder.** Send 404Hz as first tone while in quiet termination. Upon detecting 404Hz, INTELIPORT sweeps 408, 1008, 1808, and 2808Hz, each for 30 seconds, then reapplies quiet termination and resets the 20-minute timer. If no tone is sent within 20-minute time frame, INTELIPORT, after 20 minutes, times out and returns to idle. **Enter Full-Range Transponder.** Send any tone from 304Hz to 3204Hz (except 400, 2600, and 2700Hz - see Note) as first tone. Upon detecting tone, INTELIPORT returns similar tone (but at slight offset) for same duration tone is received or 15 sec. (whichever is longer). Tones from the STC should be sent in 100Hz increments. Upon completion and if no other tone is sent from the STC, INTELIPORT reapplies quiet termination and resets the 20-minute timer. If no tone is sent within 20-minute time frame, INTELIPORT, after 20 minutes, times out and returns to idle. **NOTE:** 400Hz can be sent any time (other than the first tone) after transponder mode is initiated. Detection of 2600Hz, at any time, causes INTELIPORT to return to command mode. Detection of 2700Hz, at any time, causes INTELIPORT to return to idle. **Release.** Accomplished via 20-minute automatic timeout feature (unit returns to idle), or by sending 2604Hz for >5 sec. (unit returns to command mode). Release to idle, send 2713Hz (>5 sec.)
10.	**4-Tone Auto-Sweep (RCV IN Port)** From command mode, send 504Hz (>5 sec.) via RCV IN port, then remove. INTELIPORT sends 1008Hz for 60 seconds followed by 60 seconds of quiet termination, then sweeps 408, 1808, and 2808 at 0dBm, each for 30 seconds, over RCV IN port, then returns to command mode. **NOTE:** STC can bypass the 60-second quiet termination portion and quickly enter the auto-sweep portion of the test, by sending 1004Hz (5 sec.), subsequently removing the tone. To escape and return to idle, send 2713Hz (>5 sec.).
11.	**Alignment Query** - From command mode, send 1204Hz. Upon detecting 1204Hz, INTELIPORT responds with either a ramp-up tone or a ramp-down tone. The ramp-up tone (308Hz to 3008Hz in ascending order) indicates align met C5 conditioning. A ramp-down tone (3008Hz to 308Hz in descending order) indicates alignment is not within C5 conditioning **Power Supply Query** - From command mode, send 1304Hz. Upon detecting 1304Hz, INTELIPORT responds with either a ramp-up tone or a ramp-down tone. Ramp-up tone indicates power was not interrupted. Ramp-down tone indicates power has been interrupted