Chapter 3

DEVICE ORGANIZATION

This section of the manual describes the contents of the primary form used to organize and compile data when installing a uM260 monitor for use with either PressureMAP or CopperWATCH. In many cases the person who installs the uM260 is not the one who enters the monitoring data into the software. Nonetheless, it is helpful if the installer completes as much of the Device Data Form as possible to assist with the data entry process. The forms are particularly helpful in correlating device or CopperWATCH monitoring pairs with *Access #s* and *Device #s* during the process of wiring pairs to the uM260.

The PressureMAP software requires a Device Data Form for each of the 4 possible binary devices and 16 analog devices (pressure and flow transducers) that can be monitored by the uM260. CopperWATCH uses one data entry form for each cable being monitored. Sample completed copies of these forms are provided in the following pages. Please refer to the Appendix section of this manual to obtain blank copies of the forms. They can be photocopied in multiples as needed.

uM260 Access Numbering

Access Numbering for the uM260 is similar in format to the 289H LSS. When used with PressureMAP, the first four devices in the system are reserved for the binary contactors, and they are assigned Access Numbers 001-01 through 001-04. These devices are followed by the 16 resistive or current loop devices (Access Numbers 002-01 through 002-16). The control relay is always assigned Access Number 003-01. For the CopperWATCH application, only Access Numbers 002-01 through 002-16 are used.

Because the uM260 does not support multiple binary device types, all of the binary contactors (001 devices) are given one *Transducer Type* designation: CPAMS_TD. The binary *Device Type* will be a contact alarm, normally OPEN. All devices with Access Numbers beginning in 002 are analog devices. Applicable Device Types are pressure transducers, flow transducers, or contact alarms. There are numerous Transducer Types that pertain to these types of devices. TABLE 3-1 below provides a summary of this information.

DEVICE AND TRANSDUCER TYPES

Please note that for the monitoring software, there is an important distinction between a Device Type and a Transducer Type. For PressureMAP, *Device Type* is a designation based on the device's position and function within the pressurization system. Common examples are UP for underground pressure transducer, MF for manifold flow transducer, AC for aerial cable pressure contactor, CA for air dryer contact alarm, and RH for relative humidity sensor. There are more than 75 possible Device Types, as shown in Table A1-1 in the *PressureMAP System Data Entry Manual*.

Transducer Type pertains to the monitoring characteristics applied to a Device Type. For example, a flow transducer requires a Transducer Type to identify whether it is a resistive or current loop device and what flow range it monitors. One example is CF/9.5, which identifies a “current flow”

transducer that reads from 0 to 9.5 Standard Cubic Feet per Hours (SCFH). A RF/50 Transducer Type applies to a "resistive flow" transducer that reads from 0 to 50 SCFH. Table A1-9 in Appendix 1 of the *PressureMAP System Data Entry Manual* includes examples of the Transducer Types that are used with the uM260 Micro Monitor.

Table 3-1 below includes Access Number, Device Type and Transducer Type designations for a uM260 monitored by PressureMAP.

Access Number	Device Type	Transducer Type
001-01 through 001-04	Binary Contact Alarm	CPAMS_TD
002-01 through 002-16	Resistive or 4-20 mA Transducer, Resistive Contactor	CF/9.5, CF/19.0, CF/47.5, CF/95.0, CF/190, CF/475, CF/950 RF/9.5, RF/19.0, RF/47.5, RF/95.0, RF/190, RF/20.0, RF/50.0, RF/100.0, RF/200 CPA/30, TANK_PCT, RP(9.5), RP/HP-PSI, CPAMS_TD, AC/115, DRYER, RR/540K
003-01	Control Relay	N/A (no data entry in PressureMAP)

Table 3-1: PressureMAP-monitored uM260 Device Information

Please note that CopperWATCH uses only Access #s 002-01 through 002-16 for the monitoring pairs. A Device Type designation of XC applies to all CSL devices installed in the system, and the applicable Transducer Type is CL/Theft (Table 3-2). Because this information does not vary, Device Type and Transducer Type data fields are omitted from the CopperWATCH Data Entry form (see page 3-11).

Access Number	Device Type	Transducer Type
002-01 through 002-16	XC	CL/THEFT

Table 3-2: CopperWATCH-monitored uM260 Device Information

PressureMAP Device Data Form

Since the uM260 is a small monitor, filling out Device Data Forms for the installation is a fairly quick and easy process. When completed, each form serves as an accurate record for both data entry and device wiring. Example 3-1 on the next page shows the type of information that is required for each Device Data Form.

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uM260 Device Data Form

Add [X] Delete [ ] Change [ ]

Office: <YOUR OFFICE> Pipe: A Engineer: Date:

Primary Specific Device Information

Device #: (11) 002-12	Access #: (11) 002-12	Type: (2) MF	Range: (4) 19.0 (S-M:) Loop: (7) 6.8	PSI: (4) — SAU:/STD: (4) —
Address: (30) MH102-NORTHWEST & SOUTH STS TD Type: (8)		Loc: (4) 20	Pipe: (4) A OAU: (4) 8.5	Norm: (7) — Chng: (4) —
Sheath(s): (7-15 times) 01 03 748				
Prim Cable: (7) 32	Prim Pair: (7) 1681	Sec Pair: (7) TD13	Sort Key: (5) —	
Plat #: (8) RT VG 73	Stickmap: (4) 3			
Remarks: (2 lines of 70 characters)				

Monitor Specific Device Data

Latitude: (10) N36 + 25.999	Longitude: (11) E122 + 15.000	
Office 1 Loc: (4) 0	Distance 1 (kft): (4) 2.5	Field 1 Loc: (4) 21
Office 2 Loc: (4)	Distance 2 (kft): (4)	Field 2 Loc: (4) 23

The screens that complete the device data entry procedure are the Primary Specific Device Information Screen, the Monitor Specific Device Screen, the Device Comments Screen, and the Cable Readings Screen. These screens are accessed from the Primary Specific Device Information Screen, by using the ***<PgUp>*** and ***<PgDn>*** keys (if you are at the MAP Computer main console) or by entering the keystrokes ***<Ctrl><F>*** (forward one screen) and ***<Ctrl><R>*** (back a screen).

PMAP Version 26

EXAMPLE 3-1: UM260 DEVICE DATA FORM

PressureMAP Device Data Field Explanations

Notice that the Device Data Form includes both *Primary Specific Device Information* and *Monitor Specific Device Data*. These two data groups correlate with the structure of the PressureMAP device data entry screens.

The data field explanations below provide an overview of the important information needed for the data entry personnel. The more information that can be provided by the uM260 installer, the easier the entire installation and data entry processes will be.

DEVICE #

This data field accommodates a maximum of 11 characters for recording the number of the monitoring device. Valid numbers are 001-01 to 001-04 (for binary devices) and 002-01 to 002-16 (for resistive and current loop transducers, plus any resistive contactors). These device numbering requirements are shown in Table 3-1.

ACCESS #

The **Access #** field is only required and only displays on-screen in PressureMAP when the User Defined Device option is turned ON. The programmed Access # is what PressureMAP uses to obtain readings from the uM260 monitor. When User Defined Devices are turned ON, the Access # must comply with the uM260's device numbering requirement (see Device # explanation above).

TYPE

This field holds the two-character PressureMAP Device Type designation, which indicates the general monitoring function performed by the device. PressureMAP uses a default Device Type of UP in this field, which represents an underground pressure transducer. For more information on assigning PressureMAP Device Types, please refer to the *PressureMAP System Data Entry Manual*, Appendix 1, PressureMAP Device and Transducer Types. This appendix can be found on the System Studies website (www.airtalk.com/map28_data_man.html).

RANGE

This field needs to be filled in only if the device is a flow transducer. Enter the maximum range of the transducer in this field: 9.5 SCFH, 20.0 SCFH, 50.0 SCFH, 100.0 SCFH, 190.0 SCFH, 475.0 SCFH or 950.0 SCFH.

PSI

This field does not pertain to the uM260 Micro Monitor. It was intended to be used in PressureMAP as an offset value for monitoring systems that could not read 5-14 psi pressure transducers.

S-M

The **S-M** (sheath mile) field only needs to be completed for devices that monitor air flow. If the device in question is a flow monitoring device, then enter the calculated sheath miles that the flow device monitors into this field.

OAU

This field only needs to be completed for devices that monitor air flow. If the device in question is a flow monitoring device, and you have not entered the device's sheath mile value in the

S-M data field, then enter the OAU value into this field. Please note that the OAU value for a source FTD is equal to the sum of the manifold OAUs. This includes the distribution panel OAU if it is fed by the pipe panel.

SAU

This field stands for the Standard Air Usage of high priority flow devices ($F and $V devices). The value placed in this field should be the normal, stable flow rate of the device. This air usage value should be obtained from researching past device history reports.

STD

This field will be displayed only for high priority pressure transducers ($P devices) and temperature devices ($T). The STD value is the standard, normal PSI value of the transducer. For $T devices, the default is 75.0 degrees F. The value that is placed in these fields should be obtained from past history reports for the transducer.

LOOP

This field must be filled in for all contactors. It specifies the loop resistance value for an alarm reading. The value entered into this field, which can be up to seven characters in length, is the total loop resistance in kilohms from the central office to the operated contactor (the contactor in an alarm state) and back to the office. Note that this field needs to be completed only for contactor devices (see PressureMAP Device Types table in Appendix 1 of the *PressureMAP System Data Entry Manual*).

ADDRESS

This field holds the device address location. If the device's address exceeds 30 characters, you will need to abbreviate it. Some examples are shown below:

- For pipe panels: (PIPE PANEL-A, NORTH)
- For distribution panels: (DIST. PANEL-C, SOUTH)
- For underground device locations: (MH-54, WILLIS & 5TH AVE.)

For all aerial and buried device locations, use the pole numbers and cross streets, terminal numbers, building names, footage, or whatever else is necessary to thoroughly identify a device location.

TD TYPE

The uM260 is capable of reading both resistive and loop current devices, as well as four binary devices. In order for PressureMAP to process data for these transducers, the appropriate TD Type must be entered in this data field. Information regarding TD Type designations, as well as a brief explanation of their usage, is provided in Appendix 1 of the *PressureMAP System Data Entry Manual*.

LOCATION

Enter the device Location Code into this field. The Location Code is an alphanumeric abbreviation assigned to all devices stationed at one particular location. Each Location Code must be unique (not duplicated) within an office. While Location Codes may consist of up to four alphanumeric characters, they are normally numbers between 0 and 9,999.

Note: All devices in the CO, CEV or other Micro Monitor installation must be given a Location Code of 0. A rare found exception to this requirement is when a distribution panel is attached to the pipe (MF).

PIPE

This field contains the pipe designation with which the device is associated. Pipe names are arbitrary designations consisting of a maximum of four characters. Assigned or existing pipe names should be used in this field. (Refer to the stickmaps for this information.)

NORM

This data field needs to be completed for all contactors and contact alarms. The input for this field can be up to seven characters in length and should reflect what the device reads in its normal, non-alarm state. Possible *Norm* entries are OPEN, CLSD, AOPN, ACLS, BOPN and BCLS.

For the Micro Monitor's contact alarms (TD Types: CPAMS_TD, AC/115, AC/230, DRYER, and RR/540), this field is initialized to a setting of OPEN. Please note that the open state (high resistance) is always interpreted as an OK reading, and the closed state (low resistance, or short for a RR/540 TD Type) is always interpreted as an alarm. Since the uM260 monitor does not detect threshold direction, all threshold triggers for these devices occur when the resistance decreases through the threshold value.

When using an analog input for a contactor or contact alarm (device designations 2-1 through 2-16 in the uM260), a contact alarm that is set up as CLSD, ACLS or BCLS will never generate a uM260 alert if it goes into alarm. For analog inputs, therefore, only the OPEN, AOPN and BOPN values should be used. Please note that this requirement only pertains to the analog inputs; uM260 devices that are connected to the binary inputs (TD Type: CPAMS_TD) will work properly with closed designations.

CHNG

This field is used in conjunction with the **SAU**/**STD** fields for $F, $V and $P and $T devices. The **CHNG** field is the amount of change that can be tolerated before the device goes into alarm. For pressure devices, the **CHNG** value represents the amount of pressure drop (in PSI) from the value indicated in the **STD** field before an alarm condition is acknowledged. For flow devices, the **CHNG** value indicates how many SCFH the device increases before an alarm is given. For temperature devices, the **CHNG** value indicates how many degrees the temperature can increase or decrease from the **STD** value before the device goes into alarm.

For a pressure monitoring device, this field will default to a value of 1.5 PSI, while a flow monitoring device will give a default value of 2.0 SCFH. For a temperature monitoring device, the default value is one third of the standard (**STD**).

SHEATH(S)

This field holds the sheath number or identification of the cable being monitored. It may also be used to identify the cables being fed by an air pipe manifold or distribution panel.

The sheath assignment for a device should be listed on the Master Transducer Log and stickmap. Sheath entries are limited to seven alphanumeric characters in length. As many as 15 individual sheath entries may be input into this data field.

PRIM CABLE

This field holds the primary cable number. This will be the "read" cable that contains the transducer conductor pairs. Entries are limited to seven alphanumeric characters.

PRIM PAIR

This field contains information that designates the primary conductor pair to which the device is connected. Primary pair entries are limited to seven characters.

SEC PAIR

Record the secondary pair number in this field. This number refers to the backup conductors assigned to the device, if they exist. Like the primary pair entries, the secondary pair entry is limited to seven alphanumeric characters.

SORT KEY

This field is for user defined device sorting. Sort Key designations may hold a maximum of five alphanumeric characters. No spaces are allowed. Option 10 of the Device Histories Menu uses this field to generate reports for all devices with the same Sort Key designation.

PLAT #

Fill in the underground, buried, or aerial record number on which the monitoring device appears in this data field. Plat numbers may be up to eight alphanumeric characters in length.

STICKMAP

This field holds the sheet number of the office stickmap where the monitoring device appears. Stickmap entries may consist of a maximum of four alphanumeric characters.

REMARKS

This data field allows for two 70-character lines of information concerning the device to be entered into the database.

The following device information fields will appear on the *Monitor Specific Device Screen* of the data entry editor. This screen is accessed from the Primary Specific Device Information Screen, by using the ***<PgUp>*** and ***<PgDn>*** keys (if you are at the MAP Computer main console) or by entering the keystrokes ***<Ctrl><F>*** (forward one screen), and ***<Ctrl><R>*** (back a screen).

LATITUDE

Beginning with PressureMAP Version 28, the format used for latitude and longitude information is *decimal degrees*, although the legacy *degrees and decimal minutes* format can entered, if desired, during data entry. Once latitude and longitude data in the legacy format have been entered and saved, PressureMAP will convert the coordinates to decimal degrees.

An example of the old format used and the corresponding decimal degrees format is shown below:

Degrees and Decimal Minutes	Decimal Degrees
N36+58.447	36.974117

LONGITUDE

This text field accepts either of these formats:

- Degrees and Decimal Minutes: hfff+mm.mmm, with h designating which hemisphere the longitude applies to (one of the following single letters: E or W); fff is an integer between 000 and 180 that indicates the degrees of longitude; and mm.mmm is an integer between 0.0 and 59.999 that designates the minutes of longitude.

- Decimal Degrees: hfff.mmmmm, with h being used only to designate a minus value (-) for a position west of the Prime Meridian, which is the longitude that runs through Greenwich, England. (Note: longitude positions east of the Prime Meridian do not require an h designation.) The letters mmmmmm represent an integer between 000000 and 999999.

DISTANCE 1 (kft)

This column is used to record the distance, in kilofeet, from the specified device location to the OFFICE 1 location. A numeric entry must be made into this position. This data field does not apply to devices located in the central office or pipe pressure TDs.

FIELD 1 LOC

This column designates the Field 1 Location Code. This column lists the Location Code of the first device location on the field side of the specified device where the cable is either fed or monitored.

Notice that a Distribution panel flow device with an assigned Location Code of "0" will have an entry in this field. Only the following types of devices are not assigned any Field Location codes: pipe pressure transducers, pipe panel flow transducers, and contact alarms.

OFFICE 2 LOC

This field holds the Office 2 Location Code. If two monitored sheaths on the office side of a device location converge into one sheath at the device location, office Location Codes are assigned to the closest device locations on each of the two sheaths. Either device location may be designated as Office 1; the remaining one is Office 2. (Refer to Appendix 2 for examples of Office 2 and Field 2 assignments.) Reference the stickmap to determine if a sheath splits.

This data field does not apply to devices located in the central office or pipe pressure TDs.

DISTANCE 2 (kft)

The distance from the specified device location to the Office 2 location. Enter the distance, in kilofeet, to the Office 2 location. Entries must be numeric.

FIELD 2 LOC

Enter the Field 2 Location Code into this field. If a sheath splits on the field side of the device location, the closest monitoring device on each of the two sheaths is assigned a field Location Code. Either device location may be designated as Field 1; the remaining one is Field 2. (See Appendix 2 for a detailed look at Office and Field situations.)

PRESSUREMAP OFFICE CUTOVER SUGGESTION

Often the uM260 installation will be a replacement for an existing office monitor (Sparton 5335, Dial-a-Ducer, etc.) in an established PressureMAP office. If this is the case, it is advisable to cut over the existing PressureMAP office and device data from the old monitor to minimize the data updating requirement and help with wiring monitoring devices at the uM260's connector block. Utilizing the

existing PressureMAP office in this way will also make it possible to retain and reuse the programmed Alarm and Report Center information associated with the office.

To help with the cutover process, you may wish to print a *Specific Device Information, All* report in PressureMAP for the office. This report will show the existing access or pin number for each monitoring device, plus any Address, Cable, Sheath, OAU, Comments or Remarks information that may have been programmed previously into the database for the various devices.

Section 14 of the PressureMAP System Data Entry Manual describes the requirements for building the uM260 office and device database, including recommendations on how to utilize existing office and device data for a cutover installation. Section 12 of the data entry manual describes how to set up Alarm Centers and calling times for the uM260.

CopperWATCH Device Data Form

When installing a uM260 Micro Monitor for use with the CopperWATCH software, one CopperWATCH Data Entry Form should be completed for each Detection Pair and corresponding Verification Pair being monitored. In most cases these pairs, and the completed form, would pertain to a single monitored cable. Where the intent is to monitor longer cable sections or reduce the spacing between installed Cable Section Location (CSL) devices, multiple Detection and Verification Pairs can be used to monitor a single cable. In this case an additional data entry form(s) would be required for the cable.

Each completed form provides data entry personnel with important information when setting up the uM260 for cable theft monitoring. The type of information required on this form for the data entry process includes the following:

GENERAL INFORMATION

- ***Law Enforcement Contact Information***—This information is used to assist in the dispatching of Law Enforcement Officers during verified "Copper Theft in Progress" alarms. The best possible contact information for local law enforcement should be used. Many jurisdictions have an emergency phone number that allows direct contact with the local law enforcement call center without first being routed through the state 911 system (for example, 831-555-0911 SANTA CRUZ POLICE DEPARTMENT- SANTA CRUZ CALIFORNIA).

- ***Telco Alarm Contact Information***—Please include the name, email address and/or phone number of the primary individual(s) designated to receive alarm information for the uM260-monitored cable theft monitoring application. Additional telephone company alarm recipients can be added, as needed, by notifying the individual responsible for performing CopperWATCH data entry.

COPPERWATCH DEVICE DATA FIELD EXPLANATIONS

- ***Cable #***—Sheath number/identification of the cable being monitored by CopperWATCH.

- ***Pair #***—Designated conductor pair used either as a Detection Pair or a Verification Pair.

- ***Access #***—A designation for one of 16 possible monitoring pairs that can be physically wired to the uM260 Micro Monitor. Eight odd-numbered Access #s are used for the Detection

Pairs (002-01, 002-03, 002-05, 002-07, 0002-09, 0002-11, 002-13 and 002-15). Eight even-numbered Access #s are used for the Verification Pairs (002-02, 002-04, 002-06, 002-08, 002-10, 002-12, 002-14 and 002-16).

- ***Device #***—The identification given to each Cable Section Locator (CSL) device installed on the monitoring pair. The format used for the Device # consists of the Access # followed by a period (.) and a single identifying digit. The first Device # for both a Detection Pair and the corresponding Verification Pair needs a zero designation (for example, 2-01.0, 2-02.0). Please note that the zero-designated device numbers do not represent a physical CSL device. They are used by CopperWATCH as a measurement reference when a loop reading is taken on the monitoring pair. The actual CSLs installed on the pair are assigned sequential numbers beginning with 1 (for example, 2-01.1, 2-01.2, 2-01.3, etc.).

  Note: In installations where a only a single monitoring pair is being used per cable, only one CSL needs to be installed at or near the end of the monitored cable. Data input for the cable in this situation would require two Device # entries: one with a zero designation (2-16.0, for example) and the other with a designation of "1." (2-16.1).

- ***Address***—This 30-character field is used to identify where the CSL is installed on the cable run. For a zero-designated device, no physical CSL is actually installed on the cable pair. The zero designation is a base reference used by the software. The address entered on the Data Entry form for a zero-designated device is the address nearest to the wire center where a theft could occur. In most situations, the zero-designated device address is the riser location where the cable exits the underground before the first installed CSL

- ***Loop***—This field is used to designate the milliampere(mA) output reading of the CSL associated with the specific XC device. Loop reading values are cumulative, with the first physical CLS installed on a pair having a 3.0 mA Loop value, the second a 6.0 mA Loop value, etc.

- ***Norm***—The value entered in this field represents the expected cumulative milliampere (mA) output reading of the monitored pair. For example, if there are seven CSLs installed on the pair, the Norm reading would be 21.0 mA.

- ***Latitude***—If available, enter the exact latitude coordinate for the CSL device. Use the following format during data entry: xdd+mm.mmm where x is either N(orth) or S(outh), dd is degrees, and mm.mmm is minutes (e.g. N36+57.827).

- ***Longitude***—Enter the longitude in a similar format: xddd+mm.mmm where x is E(east) or W(est), ddd is degrees, and mm.mmm is minutes (e.g. W121.59.515). Latitude and Longitude data is used by CopperWATCH to provide accurate information for dispatching. With lat/long coordinates CopperWATCH is able to generate an alarm with a link to a Google map which highlights the section of cable where the cut has occurred.

- ***Remarks—***The CopperWATCH device data editor includes a 70-character field that is used to designate the path that the cable follows between the CSL devices. To assist law enforcement personnel, information should be included that describes the location of the cable in relation to the *Address* field locations (for example, CABLE RUNS THROUGH VACANT LOT NORTH OF BROADWAY- ACCESS LOT @ STATE ST).

A second 70-character line in the editor's *Remarks* field is used to record the Law Enforcement Contact Information that is provided at the top of the CopperWATCH Data Entry Form. Both lines of *Remarks* information appear in a distributed CopperWATCH alarm, although the positioning and format differ for asset protection alarm recipients and telephone company alarm recipients.

The example on the following page (Example 3-2) illustrates the type of information that would appear on a completed data entry form for CopperWATCH. It represents one monitored cable, showing data for both a Detection Pair and a Verification Pair. The Detection Pair can be equipped with a maximum of seven Cable Section Locators (CSLs), evenly spaced along the length of the cable. The Verification Pair requires only one CSL, which is installed at the end of the monitored cable.

Each Cable Section Locator provides a fixed output of 3.0 milliamperes (mA), which CopperWATCH uses to check pair continuity on the Detection and Verification Pairs, detect trouble on either or both pairs, or suggest and/or confirm a cable theft in progress.

For reference a Google Earth map showing the *Address* locations of the individual devices (CSL locations) represented in Example 3-2 is provided in Example 3-3. If a confirmed Cable Theft in Progress alarm were detected for the monitored cable, the distributed alarm would include a hyperlink that, when clicked, would generate a web browser window containing a Google Map with this information. Notice that the targeted cable section is highlighted on the map for a quick visual reference for response personnel.

For additional information about CopperWATCH and the assignment of Device #s and Access #s, please refer to the System Studies website: www.airtalklcom/copperTheft.html. Detailed data entry procedures for CopperWATCH are located in Section 3 of the CopperWATCH Installation & Data Entry Manual (www.airtalk.com/reference1.html). From this reference section page, click on the *CopperWATCH Manual* link.

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CopperWATCH™
Data Entry Form

Office Name: LIVE OAK
LAN/Tel Info: IP:10.1.3.16
Installed By: R. DAVIS
Date: 3/19/13

Law Enforcement Contact Information: (831) 555-0911 SANTA CRUZ POLICE DEPARTMENT, CALIFORNIA

Telco Alarm Contact Information: JOHN SMITH – JS7341@TELCO.COM, ROB DAVIS – RD1362@TELCO.COM

Detection Pair Information — Cable #: 09 Pair #: 401 uM260 Access #: 002-01
(Maximum of 7 CSL per Cable Pair)

Device #	Address (30 characters max)	Loop	Norm	Latitude	Longitude
2-01.0	EAST CLIFF DR @ 14TH AVE	0.0	12.0	N36+57.831	W121+59.511
Remarks (70 characters max):	AERIAL CABLE NORTH OF E CLIFF DR, FROM 14TH AV WEST TO PROSPECT ST				
2-01.1	EAST CLIFF DR @ PROSPECT ST	3.0	12.0	N36+57.798	W121+59.711
Remarks:	AERIAL CABLE RUNS NORTH OF E CLIFF DR, SOUTH OF SCHWAN LAKE				
2-01.2	EAST CLIFF DR @ 7TH AVE	6.0	12.0	N36+57.790	W121+59.913
Remarks:	AERIAL CABLE EAST OF 7TH AV FOR 2 BLOCKS, FROM E CLIFF TO CARMEL ST				
2-01.3	7TH AVE @ CARMEL ST	9.0	12.0	N36+57.907	W121+59.900
Remarks:	AERIAL CABLE EAST OF 7TH AV FOR 2 BLOCKS, FROM CARMEL ST TO EATON ST				
2-01.4	7TH AVE @ EATON ST	12.0	12.0	N36+58.054	W121+59.878
Remarks:					
Remarks:					
Remarks:					

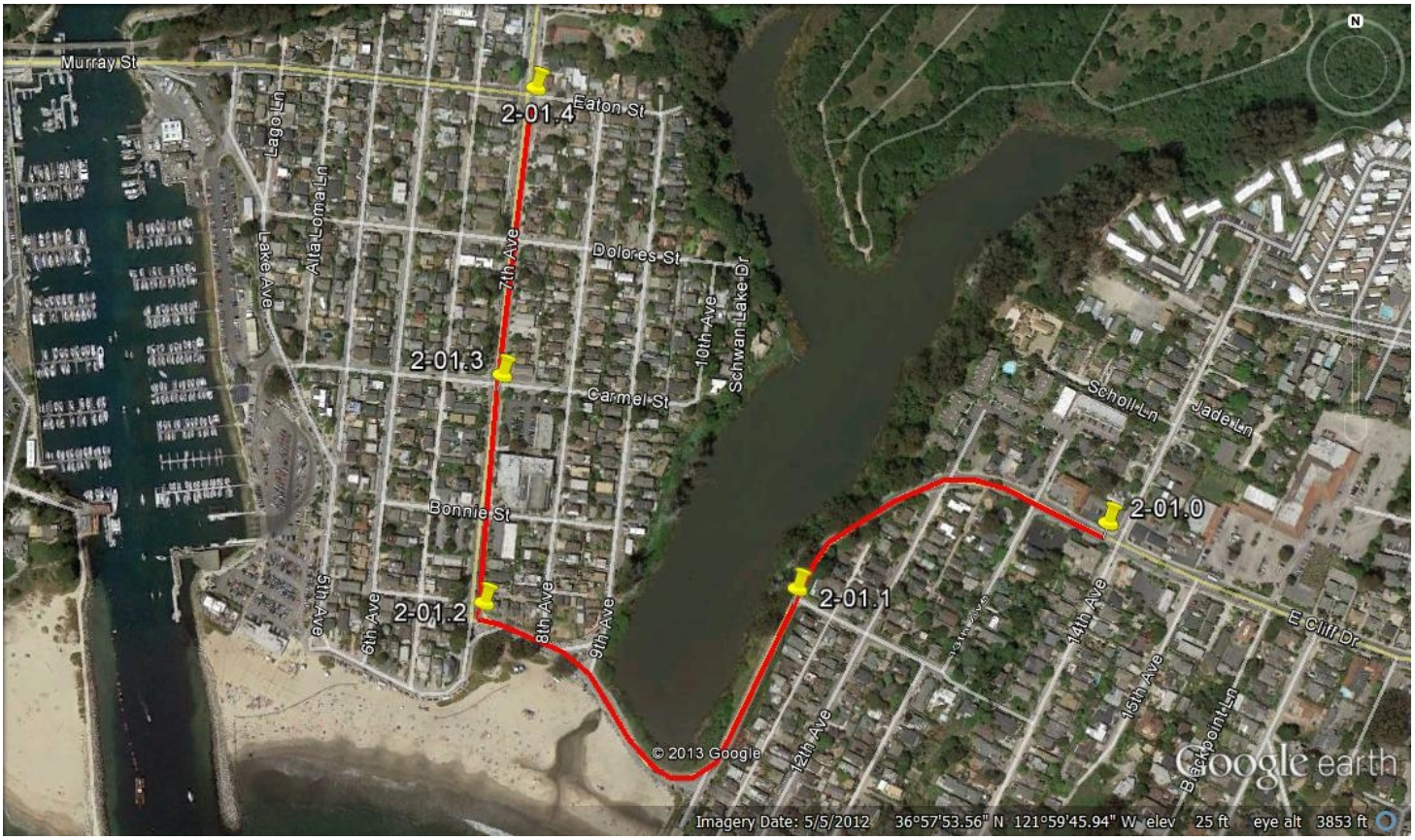
Verification Pair Information — Cable #: 09 Pair #: 402 uM260 Access #: 002-02

Device #	Address (30 characters max)	Loop	Norm	Latitude	Longitude
2-02.0	EAST CLIFF DR @ 14TH AVE	0.0	12.0	N36+57.831	W121+59.511
2-02.4	7TH AVE @ EATON ST	12.0	12.0	N36+58.054	W121+59.878

Note: Use one sheet for each Detection Pair and corresponding Verification Pair that will be monitored.

SSI Document #: 193TS-1

EXAMPLE 3-2: COPPERWATCH DATA ENTRY FORM



EXAMPLE 3-3: GOOGLE MAP SHOWING DATA FORM DEVICE LOCATIONS