



# FlexZone Quoting Guide

June 2019



# FlexZone Quoting Guide

## Notes

This FlexZone quoting guide is meant to help in analyzing site requirements and generating an complete and accurate list of FlexZone equipment to quote.

While this quoting guide attempts to cover most scenarios that will be encountered, it is not exhaustive and not meant to replace the other available resources:

- FlexZone datasheet
- FlexZone Wireless Gate Sensor datasheet
- FlexZone Product Guide
- FlexZone product presentation
- UltraLink datasheet

## Steps For Preparing a FlexZone Quotation

### Step 1 – Collect Basic Information

It is necessary to have specific information or reasonable assumptions on the following:

1. Type, height, and condition of the fence
2. Length of perimeter
3. Number and type of gates
4. Required maximum zone length
5. Standard or armored cable required
6. Means of connecting FlexZone to customer's alarm management system

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## Step 2 – Decide on Gate Solution(s)

The solution(s) used for gates may affect the other elements of the system so it is best to determine that up front. Use the following table as a guide.

Gate Type	Sensor Option		
	Sensor Cable on Gate	Wireless Gate Sensor	Microwave Unit
Swinging Gate	<ul style="list-style-type: none"> <li>• viable option</li> <li>• lowest up-front cost option</li> <li>• wear and tear on cable may require periodic replacement</li> </ul>	<ul style="list-style-type: none"> <li>• good option</li> <li>• minimal ongoing maintenance</li> <li>• provides optional gate contact input</li> <li>• requires processor with Rx card within 300 m and line of sight</li> <li>• requires customer to accept use of wireless communications</li> </ul>	<ul style="list-style-type: none"> <li>• not generally recommended for swinging gates – use one of the other options</li> </ul>
Sliding Gate	<ul style="list-style-type: none"> <li>• can be done but requires integrator to deal with cable slack take-up</li> <li>• wear and tear on cable likely to require periodic replacement</li> </ul>	<ul style="list-style-type: none"> <li>• ideal option</li> <li>• minimal ongoing maintenance</li> <li>• provides optional gate contact input</li> <li>• requires processor with Rx card within 300 m and line of sight</li> <li>• requires customer to accept use of wireless communications</li> </ul>	<ul style="list-style-type: none"> <li>• good option for customers who don't accept use of wireless communications and/or who want volumetric detection</li> </ul>

When considering the protection of gates, the following considerations should be kept in mind:

1. For small sites the cost of running cable under the roadway by the gate area can be a significant fraction of the overall system installed cost, hence eliminating the need for this should be one of the objectives of the FlexZone configuration proposed. One simple technique that can sometimes avoid having sensor cable transit the roadway is to position the FlexZone processors to allow the two sensor cable sides to terminate at the gate. Sometimes this means using both sensor cable sides even if the perimeter is short enough that use of only one sensor cable sides would be enough.
2. Some sites have infrequently used gates intended for maintenance access or are perhaps reserved as emergency gates. For these gates, the end-user may consider that to avoid trenching or boring across the roadways in these areas, it is acceptable to install a quick disconnect kit. If this option is offered be sure that the customer understands that there will be disruption to the system when the quick disconnect connector is opened.

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## Step 3 – Determine Amount of Sensor Cable Required

Use the following points as a guide:

1. Single or double pass
  - most fences can be done satisfactorily with a single pass of cable
  - a double pass is recommended for any of the following circumstances:
    - a) any fence taller than 4.3 m (14 feet)
    - b) a poor quality fence greater than 3 m (10 feet)
    - c) fences with upper and lower fabrics that are not mechanically coupled together
    - d) a palisade-style fence (Ameristar Impasse II or similar)
    - e) if there is a “fence topper” such as barbed wire or razor wire and the customer is expecting a second line of detection for that structure
    - f) the bottom edge of the fence is embedded in concrete or in the ground
2. If nothing is known about the perimeter other than the overall length:
  - assume 15% extra cable length per cable pass above the perimeter length
3. If the number and type of gates is known assume the sum of the following per cable pass:
  - 10% extra above the perimeter length for service loops, drip loops, corner and brace posts
  - 30 m (100 feet) extra for every gate that will have sensor cable applied to it
  - 40 m (130 feet) extra for every gate that will have sensor cable applied to it and is required to be a separate reporting zone
4. Divide the length of cable required by 150 m and round up to determine the number of rolls required
5. Remember to double the amount of cable if a double pass of cable is required.

## Step 4 – Determine Type of Sensor Cable Required

There is a choice between standard unarmored cable and cable that comes inside flexible aluminum conduit. Use the following points as a guide to deciding which is necessary, keeping in mind that the end user and/or integrator may have their own views.

1. standard cable
  - in the vast majority of cases, standard cable is satisfactory
2. armored cable
  - for installation on razor wire armored cable is highly recommended
  - for installation on a barbed-wire fence-topper armored cable is generally recommended but some customers will find it satisfactory to use standard cable
  - some correctional facilities will insist on armored cable for general protection of the cable

It is possible the optimum solution is a mix – i.e., standard unarmored cable for the fence and armored cable on a razor-wire topper.

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## Step 5 – Determine The Number of Processors Required

Each FlexZone processor can do detection processing for up to 600 m of sensor cable. As a starting point, the minimum number of FlexZone processors required is the total amount of sensor cable required divided by 600, rounded up.

For example, if 1,500 meters of sensor cable is required, the minimum number of processors required is  $(1,500/600)$  rounded up = 3.

Notes:

1. In the above calculation what counts is the amount of sensor cable required as determined in step #3 above, NOT the perimeter length
2. If the perimeter fence is made up of mix of flexible and rigid fence constructions – i.e., some chain-link and some palisade this calculation must be done separately for each contiguous section. This is because a FlexZone processor has a setting that optimizes its processing for either flexible or rigid fences. Flexible fences are typified by chain link or razor wire coils, rigid fences are typified by palisade.
3. Even if different sections of fence are of the same general type (flexible or rigid), it may be advisable to not mix them on one sensor cable side if the sections have significantly different characteristics. This is because the Event Window, Event Count, Alarm Windows, and Target Frequencies are set for a complete sensor cable side (Side A or Side B) at a time and different fence characteristics such as height may dictate different settings. For example, chain-link fence and razor-wire coils should not be mixed on the same FlexZone cable side even though they are both considered flexible per the FlexZone Fence Construction setting.

The calculation and notes above establishes the minimum number of processors required. In most cases this will be the actual number required but there are circumstances where adding one or more processors may be advisable. These circumstances include:

1. The desire to position a FlexZone processor to be within line-of-sight of a Wireless Gate Module
2. Reducing the installed cost of associated power and data cabling

The primary example of the second point above is where the costs of running power and/or communication cabling to the first and last processor can be reduced by locating a processor or processors nearer to the control room building than they would otherwise be located.

## Step 5 – Determine The Number of Processors Required Cont'd

In Figure A below the amount of sensor cable required to cover the perimeter fence is exactly 1,800 m. This can be covered by using just 3 processors. However, the positioning of the FlexZone processors would require that power and data cabling be run for 300 m on each end of the perimeter for a total distance of 600 m (assuming redundant connections). Running such power and/or data cabling could be expensive, particularly if facility or local construction codes require that power and/or data cabling be put in conduit, and even more so if the conduit must be buried.

In Figure B below, a FlexZone processor is placed on each side of the control room building to minimize the amount of power and data cabling required. Since the two processors near the building are only providing 300 m of detection processing, an extra processor is required, resulting in a total of 4. However in many cases the cost of the extra processor is more than compensated by the reduction in power/data cabling costs.

Figure A

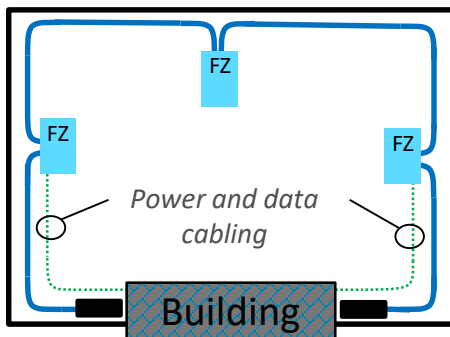
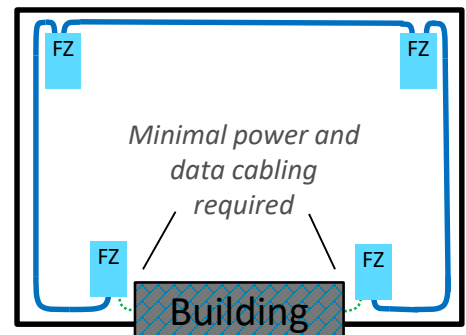


Figure B



## Step 6 – Determine The Type of FlexZone Processors Required

There are two types of FlexZone processors:

1. FlexZone-4 – Allows the physical cable attached to it to be divided into up to 4 logical zones
2. FlexZone-60 – Allows the physical cable attached to the processor to be divided into up to 60 virtual zones

The type of processor to select will depend on the maximum allowable zone length that the customer is targeting. FlexZone-4 when used with the maximum amount of cable will provide for 150 m zones (measured by cable run, about 130 when measured by the fence run). For shorter zones a FlexZone-60 is required.

## Step 7 – Determine How the FlexZone System Will be Connected to the Customer’s Alarm System/Security Management System

The following paragraphs lay out the available options for connecting the FlexZone system to the customer’s alarm system/security management system (SM). What is to be quoted will be heavily influenced by the end customer’s preferences and what alarm management equipment already exists at the facility or is in the approved design.

The available options include:

1. Using the 4 (or 8 by adding the relay card) relays built-in to the FlexZone processor:
  - this option is ideal for small single-processor sites such as small electrical substations or equipment yards where the processor can be installed near or inside the equipment room and the alarms are typically reported to an existing alarm panel handling other physical security alarms
2. Using UltraLink relays modules with UltraLink “Network Manager mode”:
  - this option is suitable for larger sites with multiple FlexZone processors or where more than 4 zones per FlexZone is desired AND no software integration to the SMS is available
  - Network Manager mode has the following limitations that must be kept in mind:
    - a) maximum of 8 Silver Network devices (FlexZone or others)
    - b) maximum of 136 UltraLink relays (UltraLink processor and 4 expansion modules)
    - c) Network Manager mode does not provide for remote calibration and maintenance of the processor via the UltraLink – UCM access is only available with a direct USB connection at the processor
3. Using UltraLink relay modules with the full Network Manager software:
  - use this option for sites with more than 8 Silver Network devices or that place value on remote calibration and maintenance capabilities AND no software integration to the SMS is available
  - use of the full Network Manager allows UCM access to the FlexZone processors from any location that can establish an IP connection to the Network Manager
4. Using an available software integration:
  - if a software integration exists to the customer’s SMS, this will generally be the best option to use
  - no UltraLink modules or matching SMS input panels are required

# FlexZone Quoting Guide- Flow Chart



Select Processor Module(s)

Select from one of:  
 -G6EM0101 (FZ-4)  
 -G6EM0102 (FZ-60)  
 Set quantity based on perimeter length

Select Cable Type

Select from one of:  
 -G6FG0111 (standard cable, 150m)  
 -G6FG0200 (armored cable, 150m)  
 Set reel qty based on perimeter length  
 Allow 15% extra over perimeter length  
 (or do detailed calculation)

Armored cable

Standard cable

Select Cable Ties (Armored Cable)

Select from:  
 - GH1080-08, 100 SS cable ties  
 One per 6m of cable  
 -82-130020, 1000 SS bar ties

Select Cable Ties (Standard Cable)

Add:  
 -GH0916, 1000 ties  
 One per 300m of cable

GH1080-08

82-130020

Select Cable Tie Tool

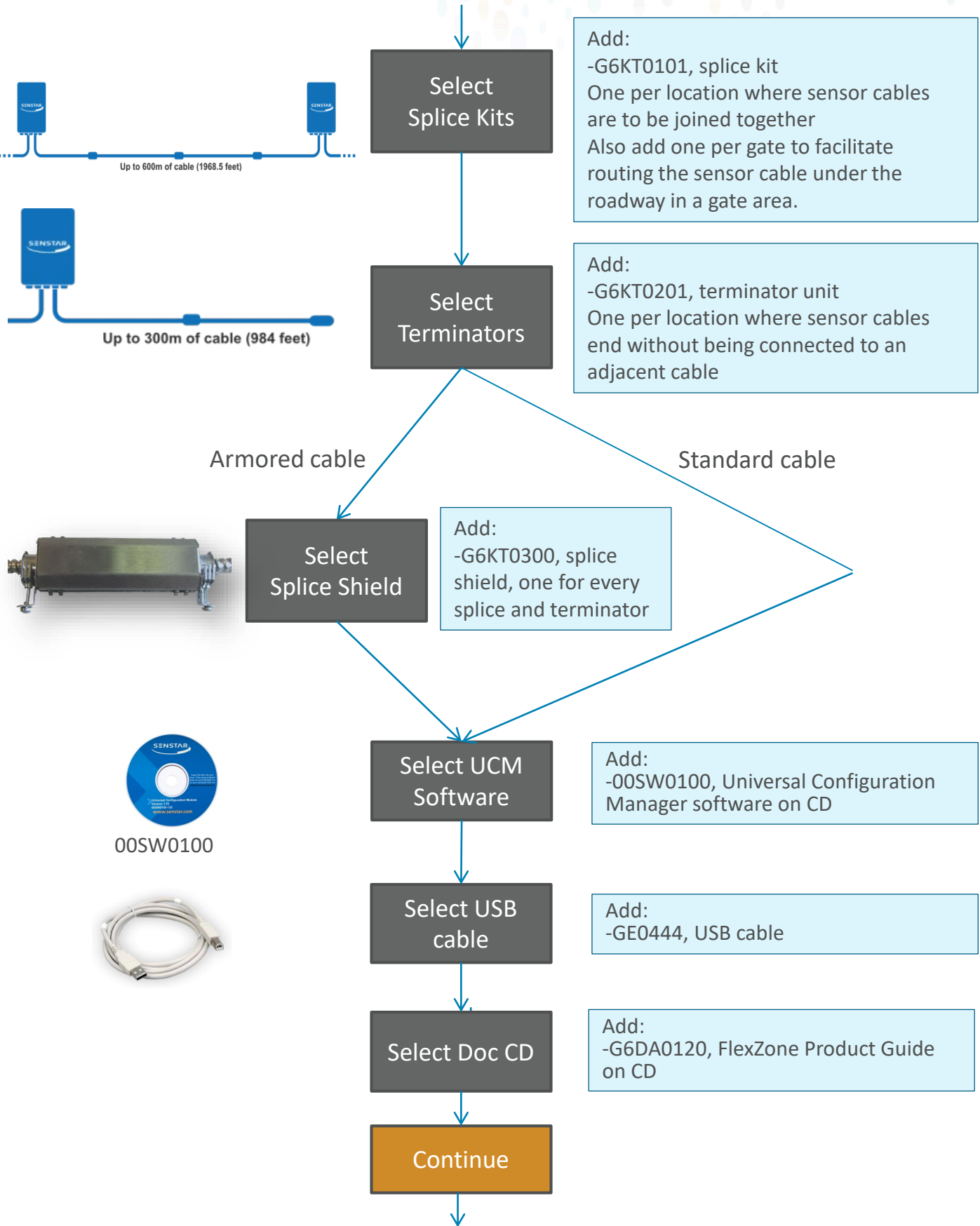
Add:  
 - GX0310, tool for SS cable ties



Continue



# FlexZone Quoting Guide- Flow Chart



# FlexZone Quoting Guide – Wireless Gate Sensor Option

Information required to prepare quote:

- number of gate panels to protect (recommended for sliding gates, can be used on swinging gates as well)
- approximate location of gates relative to FlexZone processors
- use a maximum distance of 300 m AND line-of-sight between wireless gate sensors and FlexZone processors as a planning guide



E7EM0201



E7EM0202



E7FG0301  
(comes with antenna)

Select Gate  
Sensor Type

Select from one of:

- E7EM0201, battery-powered module
  - E7EM0202, solar-powered module
- Set quantity based on number of gate panels to protect

Select  
Receiver  
Module

Select:

- E7FG0301
- Set quantity – use one per gate as a planning guide

Continue

# FlexZone Quoting Guide – Communications Cards

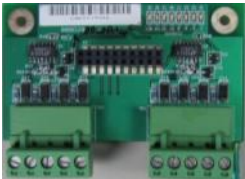
00BA1901  
(MMFO)



00BA2000  
(RS-422)



00BA2101  
(SMFO)



00BA2200  
(Ethernet)



Select  
Connection to  
Alarm  
Management  
System

Select:

- onboard relays – configuration complete, or
- Silver Network communications: - choose from one of:
  - 00BA1901 multi-mode fiber optic (MMFO)
  - 00BA2000 RS-422 comm card
  - 00BA2101 single-mode fiber optic (SMFO)
  - 00BA2200, Ethernet card
- adjust quantity – one for single-point connection, two for dual-point connection

Onboard relays

RS-422

MMFO

SMFO

Ethernet

Configuration of Outdoor Elements is Complete

Configuration Complete

Configure head-end options

Configure head-end options

Configure head-end options

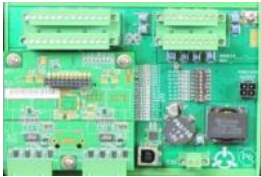
Configure head-end options

# FlexZone Quoting Guide- Flow Chart

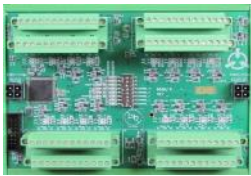
## Head End Connection Configuration with UltraLink Network Manager Mode

This option requires that the customer's security management system provide dry contact inputs to receive the relays outputs from the FlexZone system.

This option is limited to supporting up to 8 FlexZone processors and up to 4 32-relay expansion boards.



00EM1400



00EM1600



GP0151-48



Select UltraLink Processor

Select:

- 00EM1400, UltraLink processor module, provides 8 relay outputs for zone alarms

Select Communications Card for UltraLink Processor

Select to match comm card on FlexZone processor:

- 00BA1901 multi-mode fiber optic (MMFO)
  - 00BA2000 RS-422 comm card
  - 00BA2101 single-mode fiber optic (SMFO)
- Note: Ethernet card is not an option

Select Relay Expansion Modules

Select:

- 00EM1600, 32-relay expansion module
- Select quantity as required up to a max of 4

Select UltraLink Power Supply

Select:

- GP0151-48, 40W 48VDC supply

Select extended link cable

Select:

- 00CA0103, UltraLink link cable, may be required for connecting expansion modules that are not side-by-side

(Optional) Select swing-out rail

Select:

- 00MA0100, UltraLink rack-mount swing-out DIN rail, 4U

Head-End Connection with UltraLink NM Mode Configuration Complete

# FlexZone Quoting Guide

## Head End Connection Configuration with Network Manager Software and UltraLink Relays

This option requires that the customer's security management system provide dry contact inputs to receive the relays outputs from the UltraLink relays.

There is no practical limit to the number of FlexZone processors and UltraLink relays that can be supported with this option.



00EM1301/00EM1302



00EM0200/00EM0201



00FG0220



00EM1400

Select interface device that matches the type of communications card installed in the FlexZone processor(s)

For "Classic Silver Network select from:

- 00EM1301 Mini-SNIU RS-422/MMFO to USB converter for either RS-422 or MMFO connection (always use two)
- 00EM1302 Mini-SNIU RS-422/SMFO to USB converter for either RS-422 or SMFO connection (always use two)
- 00EM0200 rack-mount SNIU for either RS-422 or MMFO
- 00EM0201 rack-mount SNIU for either RS-422 or SMFO

Interface device – Ethernet

For an Ethernet connection to the processors the integrator or end-user must provide an Ethernet switch

Select Network Manager software (runs on customer-supplied computer)

Select:  
-00FG0220, Network Manager Software

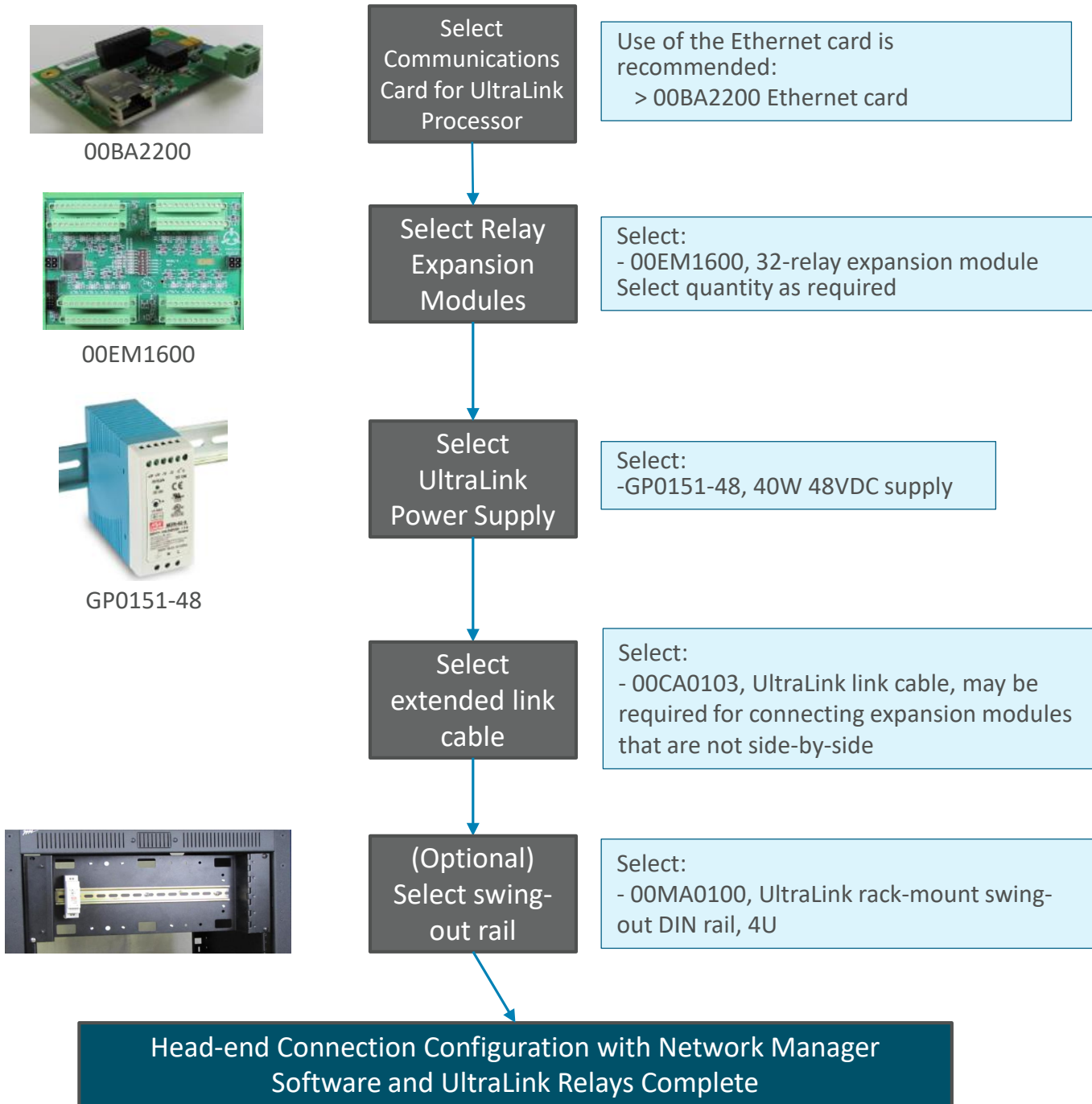
Select UltraLink Processor

Select:  
- 00EM1400, UltraLink processor module, provides 8 relay outputs for zone alarms

Continue

# FlexZone Quoting Guide

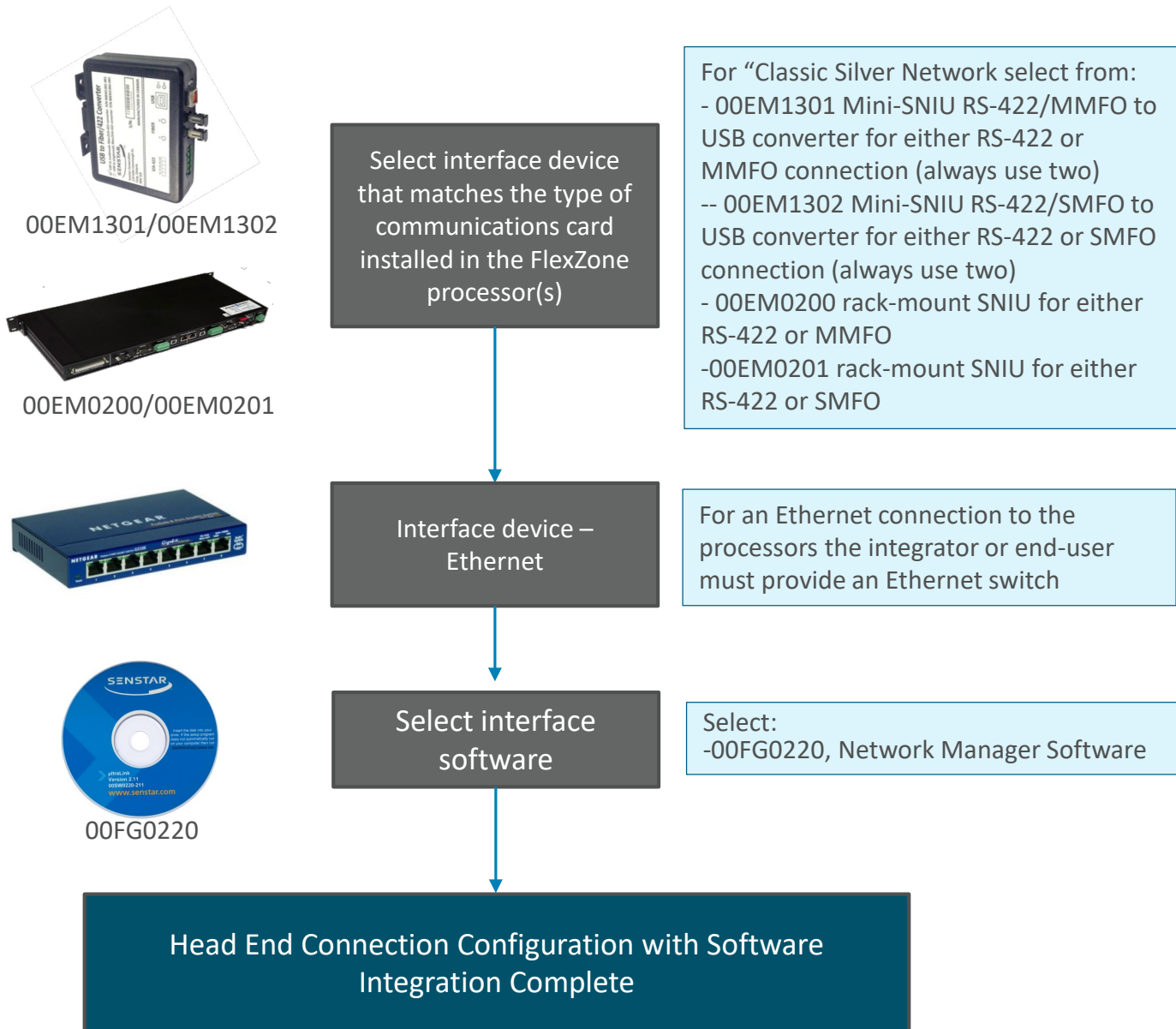
## Head End Connection Configuration with Network Manager Software and UltraLink Relays Cont'd



# FlexZone Quoting Guide- Flow Chart

## Head End Connection Configuration with Software Integration

This option requires a customer-furnished PC to run the FlexZone Network Manager Software and presumes that there is a completed software integration between the Network Manager and the customers security management system.



# FlexZone Quoting Guide- Flow Chart

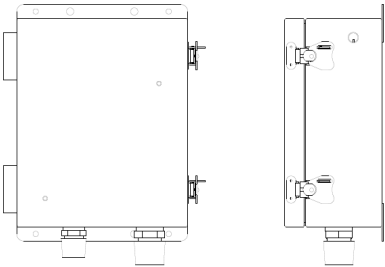
## Power Supply Options



GP0154-050

Indoor-rated PSU

Select when power supply can be installed in an indoor location:  
- GP0154-050, 50W 48VDC DIN-rail mount PSU



A4EM0200

Outdoor-rated PSU

Select when a power supply is required in an outdoor location:  
- A4EM0200, 100W 48VDC outdoor-rated PSU in NEMA 4/IP 66 aluminum enclosure



# FlexZone Quoting Guide- Example 1

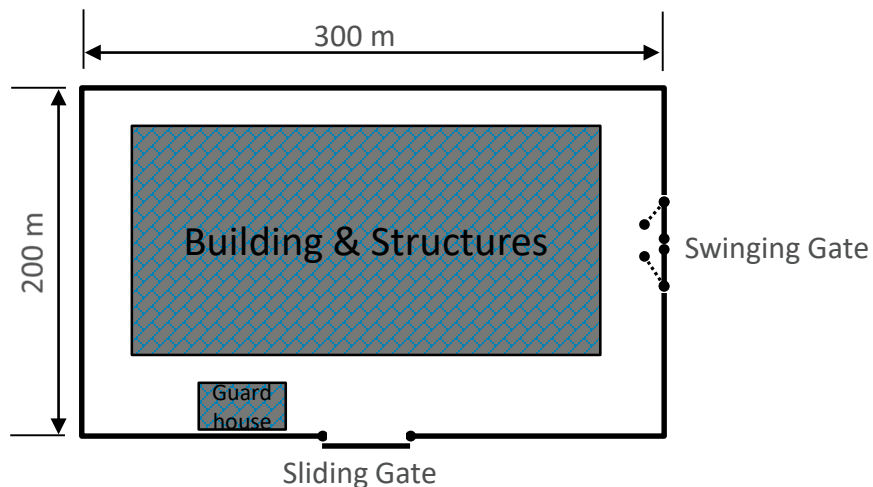
## Power Supply Options Example

An industrial facility has a rectangular-shaped perimeter as shown in Figure 1A with an 8' chain-link fence. There is a main sliding gate centered on the front side of the facility with the guardhouse/security building adjacent to it. Approximately mid-way along the east side there is a secondary gate, this one is a swinging gate.

Additional information:

- there are existing conduits to allow cable to be run across the two roadways in the gate areas if required
- the area enclosed within the perimeter fence is largely filled up by the buildings and other large structures of the facility
- the facility uses a security management system for which there exists a software integration via Network Manager
- the connection to the security management system is to be made in the guardhouse/security building
- the end user's physical security manager wants to see 50 meter zones

Figure 1A

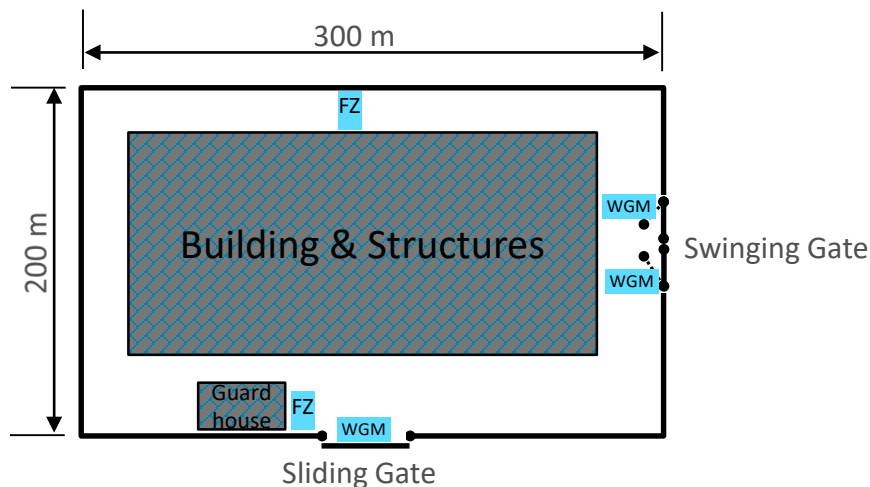


# FlexZone Quoting Guide- Example 1 Solution

## Solution Discussion

The natural start for a solution would be to position a FlexZone processor near the guardhouse where one can easily make power and data connections to the guardhouse equipment. With proximity to the guardhouse the use of Ethernet to connect to the nearest FlexZone processor is compelling. The total perimeter of 1,000 m should be able to be comfortably done with two processors. Assuming the use of the Wireless Gate Sensor for protecting the gates the basic solution with regard to positioning of sensors, the system would look like figure 1B.

Figure 1B



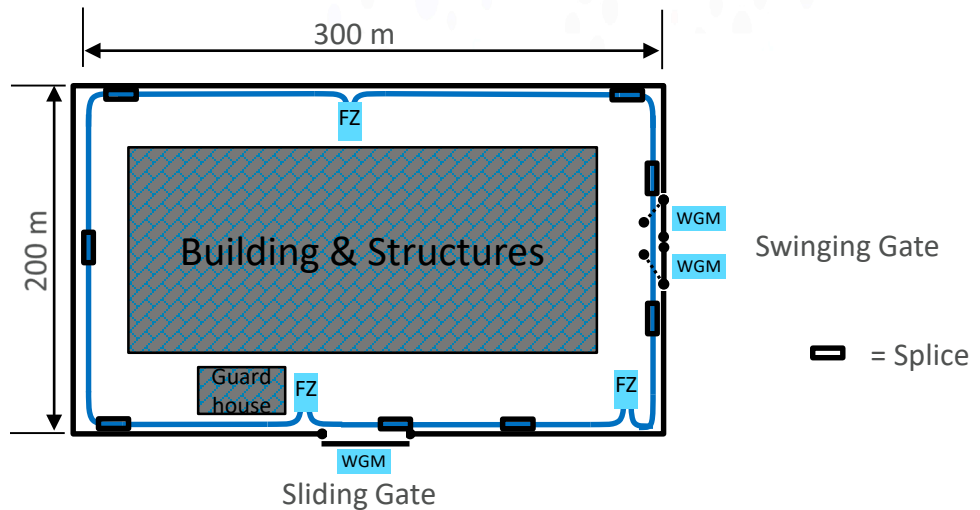
However there is a flaw in Figure 1B in that there is no line-of-sight from either processor to the east-side gate (or at least it cannot be assumed). Therefore an adjustment must be made to provide a workable solution. The options include:

1. Positioning one of the two proposed processors to be on the south-east corner of the facility so that it has line of sight to both the front gate and the east gate. This would work but would require some 150 m or more of auxiliary cabling to run from the guardhouse to the FlexZone processor and also rule out a simple Ethernet connection which is limited to 100 m.
2. An additional FlexZone processor could be added and positioned to provide line of sight to the east gate. As per the above it would be advantageous to put the processor at the south-east corner so that the wireless modules on both gates have line-of-sight to one processor (only one receiver necessary). The third processor would be positioned close to the guardhouse to minimize auxiliary cabling requirements.
3. Mount FlexZone sensor cable on the east-side gate panels to protect the gate, thus removing the line-of-sight restriction. While providing a solution with the lowest cost package of Senstar equipment this option does not provide the opportunity to pick-up a magnetic gate contact from the east gate and has the potential to require ongoing maintenance where the sensor cable run between the fence and the gate panels.

All 3 options above are viable, for this example we will assume that Option 2 is used, so the solution is diagrammed as in Figure 1C.

# FlexZone Quoting Guide- Example 1 Solution Cont'd

Figure 1C



## Solution Summary

- three processors required
- cable requirements – standard cable, take perimeter length of 1,000 meters and add 15% to yield 1,150 meters of cable required
- gate solution – wireless gate sensors, for this example assume solar powered, with receiver in FZ 3#
- Ethernet for communication
- the Network Manager software will provide the integration to the customer's security management system

# FlexZone Quoting Guide- Example 1 Solution Cont'd

## Detailed Product Selection

Item	Notes	P/N	Qty
Processor	select three FlexZone-60 processors. In theory to meet the zone-length requirements two of the processors could be FlexZone-4 with the only the north-side processor being a FlexZone-60. However to simplify sparing considerations and for overall simplicity it's not recommended to mix processor types	G6EM0102	3
Cable	To yield 1,150 meters of cable eight 150 m rolls are required	G6FG0111	8
Cable ties	To cover 1,150 meters of cable 4 bags are required (one bag per 300 m of sensor cable)	GH0916	4
Splice kits	Between FZ #1 and FZ #2 four rolls of cable (or parts thereof) are needed meaning 3 joins are required so 3 splice kits for that section. Between FZ #2 and FZ #3 three rolls of cable are needed meaning 2 joins are required so 2 splice kits. Add a splice kit to facilitate routing the cable under the roadway at the east gate. Between FZ #3 and FZ #1 1 roll of cable is needed along with using some cable that is excess to the rolls above meaning one join so one splice kit. Add a splice kit to facilitate routing the cable under the roadway at the south gate.	G6KT0101	8
Terminators	Not required as the perimeter is a fully closed loop	G6KT0201	0
UCM	Add UCM software on CD	00SW0100	1
USB cable	Add USB cable	GE0444	1
Product Guide	Add FlexZone Product Guide	G6DA0120	1
WGS Module	Add Wireless Gate Sensor Module, solar. One for the sliding gate and two (one per panel) for the swinging gate	E7EM0202	3
WGS Receiver	Add Wireless Gate Sensor receiver card	E7FG0301	1
Comm card(s)	Add one Ethernet card. Note that having only one communication connection to the FlexZone processors does not provide for communications redundancy but this is most likely acceptable for a relatively small site and an industrial facility (not likely acceptable for a prison by comparison)	00BA2200	1
Continue On Next Page			

# FlexZone Quoting Guide- Example 1 Solution Cont'd

## Detailed Product Selection Cont'd

Item	Notes	P/N	Qty
Network Manager Software	Select Network Manager software	00FG0220	1
Power Supply	Select one indoor-rated power supply that can be installed in the guardhouse to provide power to the 3 FlexZone processors. Notes: <ul style="list-style-type: none"><li>while Ethernet PoE could be used to power FZ #1, PoE does not provide enough power to enable power sharing over the FlexZone power cable. So a separate power supply is required</li></ul>	GH0154-050	1