LinkLocator™

Users Manual

Model 1 shown with MBL Touch probe and fobs

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General

LinkLocator™ is a break through product solving a deficiency in the Dallas-Maxim 1-wire® product set. Previously, 1-wire and iButton devices could appear on the 1-wire network and be discovered, however, since the slave could appear anywhere, the location of that device was unknown.

Previous attempts to solve this deficiency have included schemes using switches to switch the iButton read head on and off the bus so that the location can be implied by the state of the switch. This approach, while workable for small numbers of probe heads, introduces switching noise, settling times, and reduced noise immunity for the overall bus.

The LinkLocator uses no switches. Its approach to location is to monitor the bus traffic and add additional information to the 1-wire data stream during a search or Alarm Search ROM command. LinkLocator can be used with any iButton probe head. Simply wire the LinkLocator between the probe head and the 1-wire bus. Multiple LinkLocators can reside on the same bus. The 1-wire behind the LinkLocator must be kept short, a maximum length of 1.5 meters is recommended.

Several models of the LinkLocator include additional functionality. The Model 1 LinkLocator is designed for use in retrofit applications. The Model 2 is an end user package with dual RJ45 connectors. The Model 2 is intended for proof of concept evaluations. The Model 3 (iButtonLinkReader™) is designed for new installations and is packaged to minimize installation costs.

LinkLocator is also available for OEM's as a chip level product for inclusion in the OEM's product. The chip level product is available in 8-pin DIP and SOIC-150 packages. Chip level products are available only under NDA and purchase minimums apply. Chip level products are available as PB free parts for OEM's designing for the EU market.

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Software Programming:

Locate Mode:

Locate Mode happens completely within the NORMAL OW protocol mode.

Normal protocol mode is selected by the \O Link Master Command. This is the default operating mode of LinkLocators and is the power up mode.

The LinkLocator monitors the 1-wire® ROM search (0xF0) or ROM alarm search (0xE0). If the selected 1-wire device is down stream of the LinkLocator, the LinkLocator becomes selected.

The LinkLocator then monitors for a 0x00 byte coming down the bus. Receipt of this byte arms the LinkLocator. The LinkLocator will respond with its serial number bytes to the next 8 byte reads that are issued by the 1-wire master.

Please note: The 1-wire device selected with the search is NO LONGER SELECTED. The 0x00 byte caused the 1-wire slave to deselect.

Example using Link45 ASCII commands:

\F is the locator first command. It will search the 1-wire network for the lowest 1-wire serial number and return it along with the serial number of the locator associated with it.

The Link45 response is of the form

`Sxxxxxxxxxxxxxxxx,yyyyyyyyyyyyyyyy`

Where:
S indicates the status of the 1-wire search. The possible values of S are:

+ … This is not the last 1-wire device on the network. (There were discrepancies during the search.
- … This is the last 1-wire slave address on the network. (No discrepancies noted)
E … An error occurred during the search. The search results are invalid.
N ... No slaves were present on the 1-wire network (No presence)

`xxxxxxxxxxxxxxxx` is the serial number of the 1-wire slave discovered

`yyyyyyyyyyyyyyyy` is the serial number of the LinkLocator associated with `xxxxxxxxxxxxxxxx`

If the 1-wire slave was NOT downstream of a LinkLocator, the Locator serial number will be `FFFFFFFFFFFFFFFF`.

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Extended Mode:

Extended Mode is used to command and search LinkLocators. Please note that 1-wire slaves from Dallas-Maxim do NOT participate in Extended Mode. A special command sequence is sent by the Link Master to cause ALL Dallas-Maxim parts to ignore the bus so that only eXtended mode slaves will participate. LinkLocators use FxB communications during eXtended mode, so there is no conflict with the Dallas-Maxim parts.

Extended Mode is entered by issuing the \X command.

LinkLocator responds to the following ROM commands when in Extended Mode:

Commands common to all eXtended Mode Slaves:

Search ROM (0xF0)
Alarm Search ROM (0xE0)
Skip ROM (0xCC)
Read ROM (0x33)
Match ROM (0x55)

Commands specific to the LinkLocator

Green LED on (0x12)
Red LED on (0x13)
LED's off (0x14)
Report Software Version (0x01) Read one additional byte after the 0x01 command. The major software version will be in the high nibble, the minor software version will be in the low nibble. The current version of LinkLocator returns 0x10 (Version 1.0)

The Family code of LinkLocator is 0xFE. The serial number format is exactly the same as Normal Mode.

Example: The user wishes to produce an inventory of all LinkLocators on the bus.

`\X ...` Specify eXtended mode. The Link45 will respond X<CR><LF>
`f ...` The Link45 will respond ...

`Syyyyyyyyyyyyyyyy<CR><LF>`

Where:

S is the status of the search. Possible values are +,-,N,E
`yyyyyyyyyyyyyyyy` Serial Number of the first LinkLocator on the eXtended Bus.

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Then the programmer will issue next commands (n) retrieving the serial number of each of the LinkLocators until the Status character is – (indicating that the search is complete).

Model and Wiring Information:

Model 1:

The LinkLocator Model 1 is supplied as an encapsulated (potted) package cylinder shaped. The dimensions are 0.5 inch diameter, 1.5 inch length. The hookup wires exit the cylinder on one end. This is an end user package designed to be integrated with the users probe head. It is specifically designed for the MBL Technologies Touch Reader available separately. The Model 1 is shown inside a MBL Technologies WeatherTight Enclosure. The Model 1 is appropriate for retrofit applications.

The wire designations are:

Orange (+5V) (optional but recommended)
Blue ... Master bus 1-wire
Yellow ... Located bus 1-wire
Black ... Ground
Black ... Ground
Green ... To BiColor LED on MBL Touch Reader
Brown ... To BiColor LED on MBL Touch Reader

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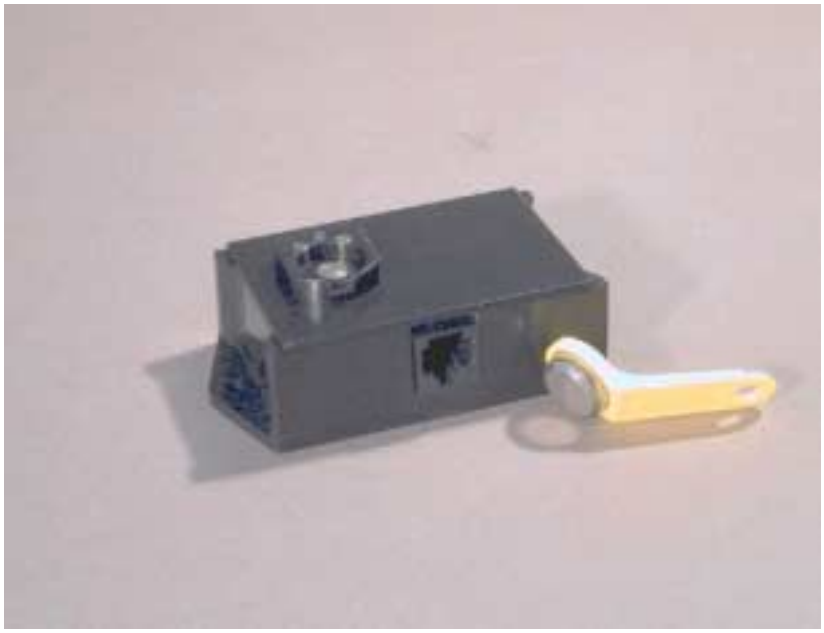
Model 2:

The LinkLocator Model 2 is supplied as a packaged unit with enclosure box, MBL touch reader, and embedded LinkLocator. The 1-wire network connections are RJ45. This is an end user package intended for proof of concept testing. Indoor use only.



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Model 3 (Also known as the iButtonLinkReader™)

The Model 3 (iButtonLinkReader™) is a tight integration of the LinkLocator and the MBL touch reader. The LinkLocator is implemented as a “little round board” attached to the pins on the back of the MBL Touch Reader. This model is designed for new installations. It is designed to optimize installation costs.

The Model 3 is supplied with 24 inch pig tail connection wires.

Blue – 1-Wire communications
Black – Ground
Orange – Optional (Recommended) +5V DC

Note: For outdoor use, we recommend using the Model 3 with the MBL Weather Tight enclosure.

The hole recommended for the iButtonLinkReader is a 20mm “Double D”.

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