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TIDLAND

Fife FIFE-500 Networking of Web Guiding Systems User Instructions



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About these operating instructions

These instructions are a supplementary description to the FIFE-500 system. They explain only the procedures for networking multiple guiding systems with one or more operator interfaces.

Please note:

All safety instructions as well as information on installation, operation, and maintenance of the FIFE-500 system can be found in the user manual "Fife FIFE-500".

These are the original instructions.

Additional safety warnings



An adapter cable must be used when connecting a web guide with a Rev. 1.1 board to a network with other web guides.

Omitting the cable can cause:

- power supply overloads
- malfunctions/damage to the affected unit, other units on the network, and network cables
- unintended operation of guides whose power cable has been disconnected
- fire in the event of a short circuit in the network cabling.



Wear a grounding wrist strap or use similar precautions against electrostatic charges when working on the controller board.

Overview

A standard FIFE-500 web guiding system consists of a base unit with the web guide and a detachable operator interface (OI), which communicate with each other using a proprietary protocol via an RS-485 interface. Recent enhancements allow networking these devices so that multiple guides can be operated from one (or multiple) operator interface(s). This document outlines the capabilities, requirements, and limitations of this networking, including components to use in networked applications and the proper setting of network terminations.

All equipment for use in networked systems should be updated to the current firmware revision. To support all functionality discussed in this document, the firmware revision on all devices must be Rev. 1.020 or higher.

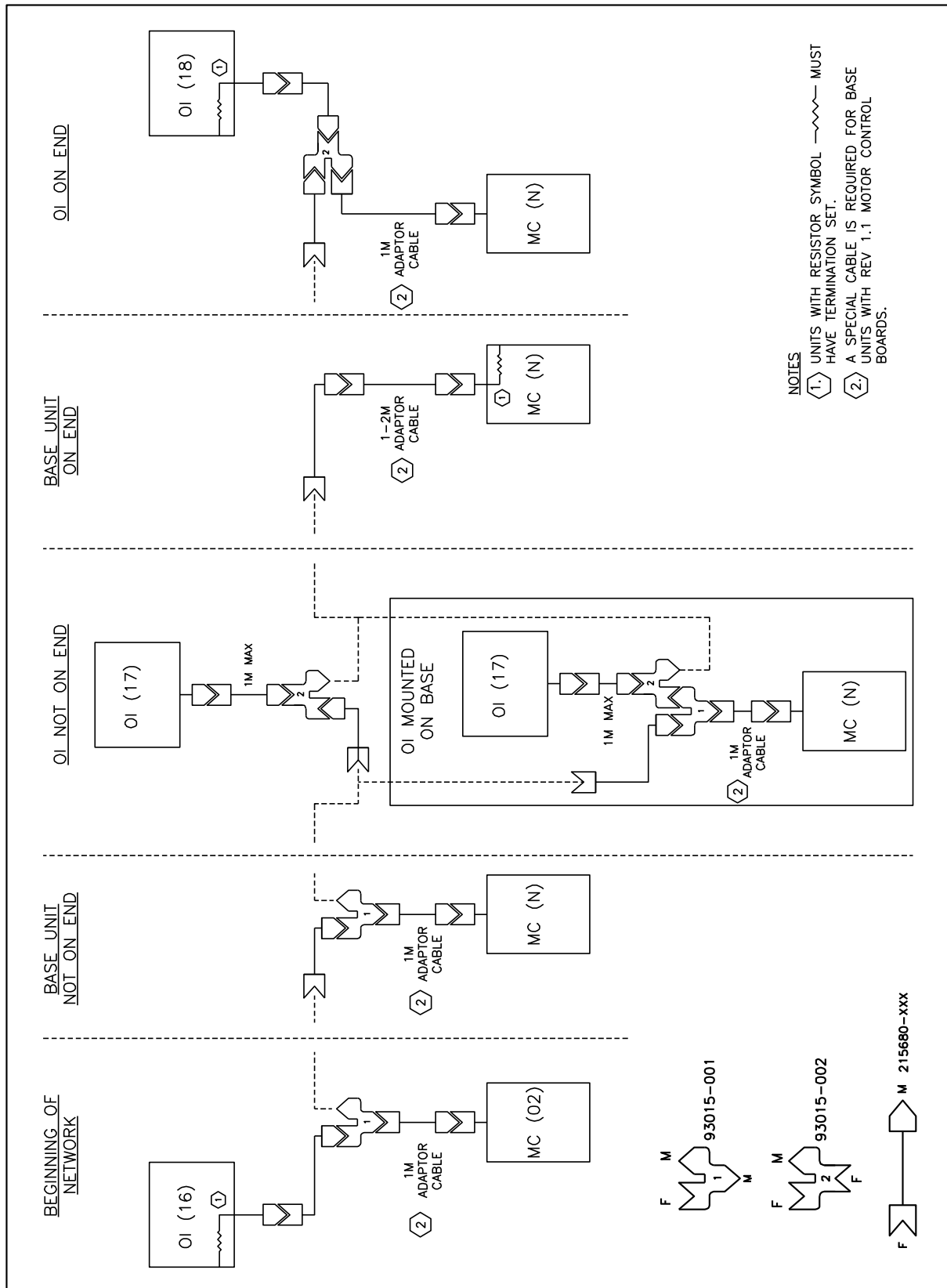
Description

A FIFE-500 network can consist of up to 30 total devices (web guides and OIs), and up to 3 of these devices may be OIs. The network consists of shielded M12 cables and:

- must be a line (not a star, ring, tree, or other topology);
- must have a termination at each end of the line (discussed in detail in Section 3);
- may have enroute branches of a maximum length of 1 m (these must not have terminations).

Figure 1 - Network Diagram (see Section 2-2) shows how devices are connected using M12 cables and two different types of Y adapters. In this drawing, "MC" refers to the "motor controller" contained in a FIFE-500 web guide's base unit. The M12 cables are 4-conductor shielded cables and carry the RS-485 pair, ground, and a +24VDC supply for the OIs.

Figure 1 - Network Diagram



Description (continued)

Cables not labeled with length limits may be any desired length such that the maximum total length of the line does not exceed 200 m, except that an OI should be no more than 20 m from the nearest web guide (otherwise, the OI may experience power instabilities). Important details to note:

- The maximum branch length between a Y adapter and a device that is not at either end of the main line is 1 m. Longer branches can result in RS-485 signal degradation and unreliable operation.
- The device at each end of the line (i. e. exactly two) must have its termination set. All other devices (connected to Y adapters along the line) must not have their terminations set. See Section 3 of this document for details on how to set termination. Improper termination settings can result in RS-485 signal degradation and unreliable operation.
- Web guides using the current Rev. 1.1 motor controller (NWG-01A) board must have the male end (large metal connector) of the networking adapter cable per drawing 215986 connected directly to their OI pigtail cable, with the female end connecting to the network.
 - For a web guide connected to a Y adapter not at the end of the line, this cable should be 1 m long, with its female end connecting directly to the Y adapter.
 - For a web guide at the end of the line, this cable may be up to 2 m long and may have standard M12 cables connected in series at the female end.
 - If this adapter cable is omitted, connecting a web guide with a Rev. 1.1 board to a network with other web guides can cause:
 - power supply overloads
 - malfunctions/damage to the affected unit, other units on the network, and network cables
 - unintended operation of guides whose power cable has been disconnected
 - fire in the event of a short circuit in the network cabling



With base units using a Rev. 1.2 board (not yet available as of the date of this document), this cable will not be needed.

Description (continued)

Web guides without operator interfaces are documented on drawing 216379. The part number allows coding of options just as on the standard guide with OI per drawing 214600. Note that on web guides using the present Rev. 1.1 controller board, network termination is controlled by jumpers inside the unit. As it is usually not certainly known where on the network a unit will ultimately be located, devices for use in a networked system should generally be ordered with no termination. This will require a termination change (and in the case of a web guide with a Rev. 1.1 board, opening the unit) on only 2 devices – namely those at either end of the line – when the systems are installed.

There is no part number coding for the presence or absence of termination, and units are normally shipped with termination enabled. For web guides and OIs to be used in a networked system and shipped without termination enabled, "NO TERMINATION" must therefore be clearly specified in the ordering text. On OIs as well as future web guides with Rev. 1.2 boards, termination can be set via a menu item without disassembling the unit; in these cases, ordering the units with no termination is less critical but still preferable for ease of installation.

Additional OIs can be ordered per drawing 214601. Depending on the application, mounting hardware such as that per drawing 215082 may be required. Up to 3 OIs may be present on a network, even if only one guide is present. The limitation to 3 OIs is due to communication latencies that would become too large with additional OIs as well as supply current limits (as the OIs are powered via the network cables from a nearby web guide).

All equipment for use in networked systems should be updated to the current firmware revision. To support all functionality discussed in this document, the firmware revision on all devices must be Rev. 1.020 or higher.

Summary of components for networked FIFE-500 systems

216379-ABCDEFG

FIFE-500 Web Guide without OI (specify NO TERMINATION in ordering text)

214600-ABCDEFG

FIFE-500 Web Guide with OI (specify NO TERMINATION in ordering text)

214601-001

FIFE-500 operator interface (specify NO TERMINATION in ordering text)

215985-XXX

Networking adapter cable required with web guides using Rev. 1.1 controller board

215680-XXX

M12 network cable

93015-001

Type 1 (female-male-male) Y adapter, used to connect additional web guides

93015-002

Type 2 (female-male-female) Y adapter, used to connect additional OIs

Drawings are available for these components; contact Fife Customer Service.

Summary of maximum device counts, cable lengths, and other limits

Maximum total number of devices in a network (sum of web guides and OIs): 30

Maximum total number of OIs in a network: 3

Maximum total network length: 200 m

Maximum branch or stub length from network line: 1 m

Maximum distance between OI and nearest web guide: 20 m

Termination requirements

To avoid signal degradation, the RS-485 line must be terminated in the device at each end of the line, i. e. in exactly 2 devices. Additional devices connected with Y adapters along the line must NOT have termination. See Figure 1 – Network Diagram (Section 2-2) for an illustration. The devices indicated with the resistor symbol shown in Note 1 – and ONLY those – should have their termination set.

Termination settings and identification

By default, web guides and OIs have the termination set (activated), typical for a basic system consisting of one web guide and one OI (which would be at each end of an RS-485 line with nothing else connected to it).

However, web guides and operator interfaces for use in networked systems should generally be ordered and shipped with the termination not set (deactivated). These networks typically contain a larger number of devices, only two of which will need to have termination activated.

A web guide with a Rev. 1.1 controller board does not support activation/deactivation of the termination via an operator interface menu. Instead, jumpers have to be positioned on the controller board inside the base unit. A web guide that is shipped with the termination deactivated should bear a label, "NO TERM" (unless it contains a Rev. 1.2 controller board, see Section 3-4). If this web guide is to be used at the end of the RS-485 line, the termination must be set.

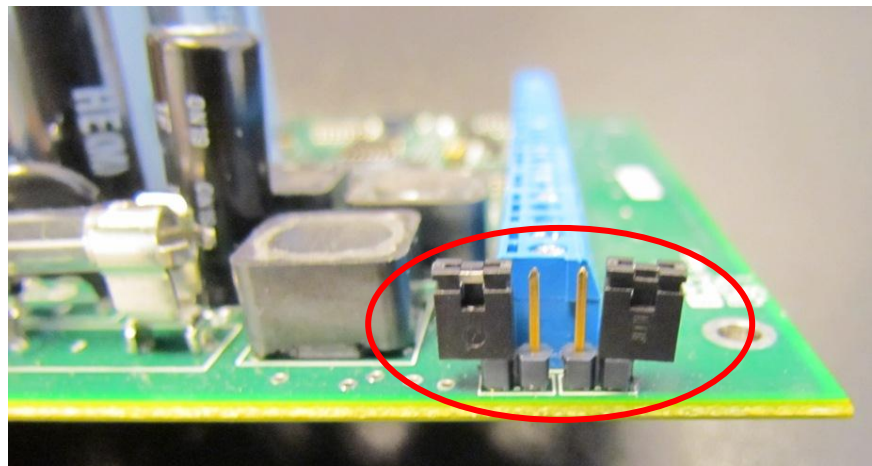
Setting the termination

Rev. 1.1 controller board



Wear a grounding wrist strap or use similar precautions against electrostatic charges.

1. Disconnect power from the web guide.
2. If the web guide has an OI attached to the right side of the base unit relative to the direction of web travel, remove it.
3. If the web guide is already connected to the RS-485 network, either disconnect it or ensure that power has also been turned off to all other web guides on the network.
4. Remove the side panel on the right side of the base unit relative to the direction of web travel. This will expose the controller board. The board does not need to be removed from the base unit. The termination jumpers are near the front right corner and should be connected as shown below on a unit with the termination deactivated:

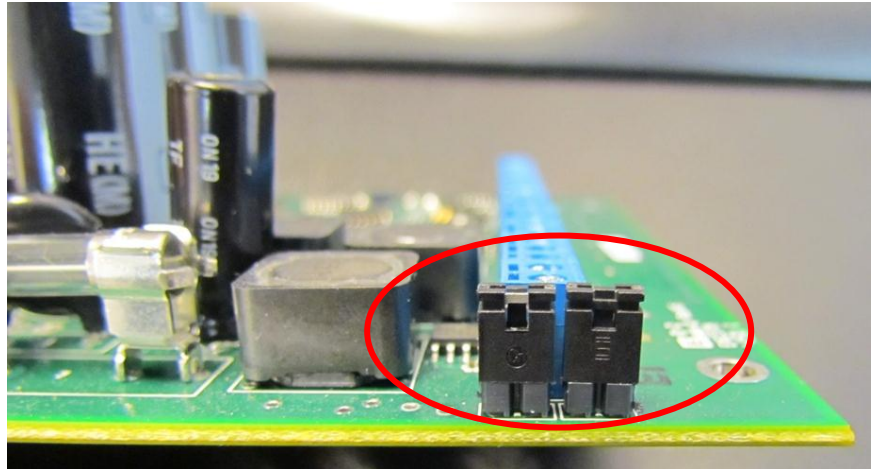


Setting the termination

Rev. 1.1 controller board

(continued)

5. To activate the termination, move the jumpers so that they each interconnect both pins of the header:



6. Reassemble the unit.
7. Remove the NO TERM label.

Setting the termination

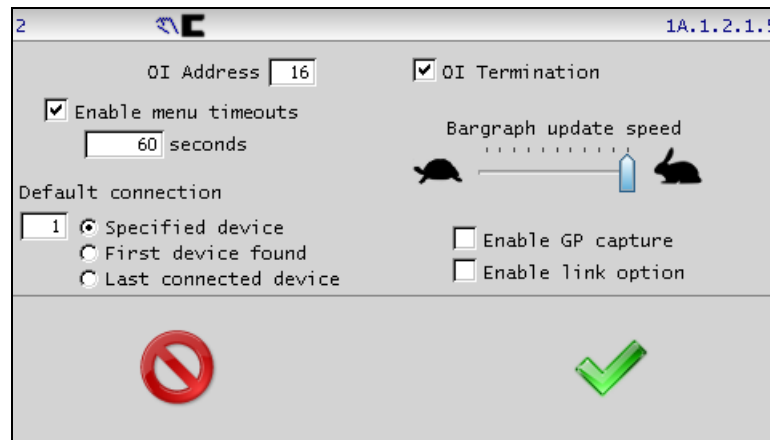
Rev. 1.2 controller board

On web guides with a Rev. 1.2 controller board, the termination can be set from an operator interface via a menu item. As of the date of this document, such guides are not yet available. These guides will be distinguished from those with the Rev. 1.1 board by a base unit serial number of 0002500 or higher. They will not bear a NO TERM label if they are shipped with termination deactivated, as the state of the termination can be readily checked and changed via the menu. See Section 4-1 for details.

On an operator interface, the termination is set via the 'OI Settings' menu. This menu is accessed from the OI main screen using the following key sequence:

From any mode  press   

The OI address and termination settings are accessible from the 'OI settings' menu as shown in this example screen.



Installation

The Operator Interface contains menu support to facilitate network administration. As previously mentioned, each device in the network must have a unique address from 1 to 30 and only the devices at each end of the network must be terminated. The network administration screen consists of buttons for each address in the network with icons indicating the device type. The OI you are using will be marked with an asterisk. The default addresses are 1 for a controller and 16 for the operator interface with termination enabled for both. If possible, it is recommended to configure the addresses and termination of the two devices located at each end of the network first.

Although not required, a logical addressing strategy is also recommended such as assigning sequential addresses starting with 2 for the first web guide in the machine. Reserving address 1 simplifies installation of networked controllers as well as replacement of existing controllers. Commissioning a network is typically done as follows:

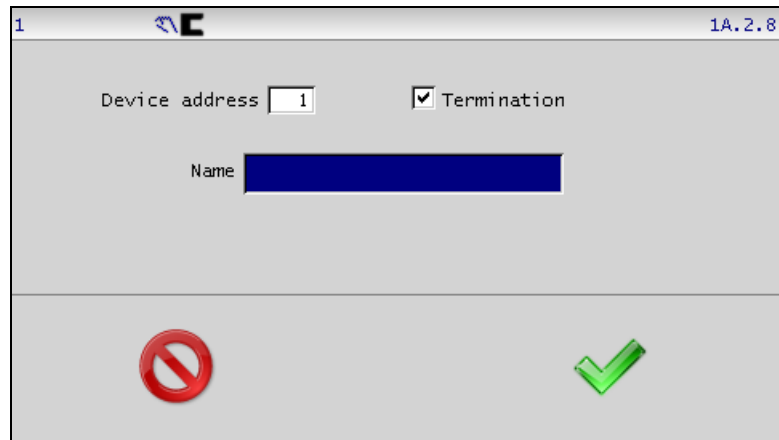
1. Start with a single OI and controller.
2. Use the network administration screen to view the network.

Press:    

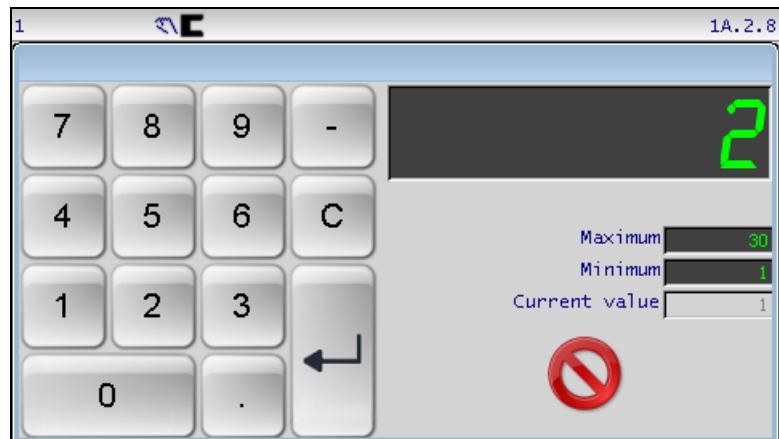


3. Select the controller at address 1 to open its configuration screen.

Installation (continued)



4. Configure termination if applicable.
5. Touch the 'Device address' edit control to enter a new address for this device. Enter the new address and press the <return> key to save.



Installation (continued)

6. The network administration screen will update to reflect the changes.



7. Shut off power to all controllers. Connect the next controller to the network. Reapply power to all connected controllers and select the network administration screen (see Step 2). The newly added controller should appear at address 1.



8. Repeat steps 3 through 7 for each controller in the network.

Installation (continued)

The same logic applies when adding OIs to the network. If installing an additional OI, reassign the existing OI at address 16 prior to connecting the new OI (since the new OI will initially appear at address 16). When multiple OIs are present, any OI in the network can perform network administration, including management of network parameters for the other connected OIs. The following screen shows two OIs and two web guides present in a network. The asterisk indicates which OI you are currently using.



Network navigation buttons on the OI main screen



Display list of all devices and allow direct selection.



Select previous web guide (decrementing address).



Select next web guide (incrementing address).

Networking of a GMA-BL actuator

GMA-BL actuators can be connected to a FIFE-500 network in the same manner as FIFE-500 web guides.

GMA-BL actuators are equipped with the Rev. 1.2 controller board. Therefore:

Termination on a GMA-BL is activated/deactivated from an OI via a menu.

A GMA-BL should be connected to a network without a 215986 network adapter cable.

Like FIFE-500 web guides, GMA-BL actuators should be ordered with no termination if they are to be used in a network, although this is less critical as the termination can be adjusted via a menu.

Return shipment instructions

If it is necessary to return the FIFE-500 to Fife for service, care must be taken to properly package the unit to prevent damage during shipment. If possible, use the original shipping containers.

Service requests and replacement parts

When ordering replacement parts, please indicate, where possible, part number, drawing number and model description.

To request service or to get replacement parts, contact one of the addresses listed below.

Fife Corporation
222 West Memorial Rd.
Oklahoma City, OK, 73114, USA
Phone: 1-405-755-1600
Fax: 1-405-755-8425
Web: www.maxcessintl.com

Fife-Tidland GmbH		
Max-Planck-Strasse 8-10		Siemensstrasse 13-15
65779 Kelkheim	OR	48683 Ahaus
Deutschland		Deutschland
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