



YHC5150X FieldMate Handheld Communicator

User's Manual



Safety Information



Preventing injury

Failure to follow all instructions could result in injury:

- Read.
- Understand.
- Follow all safety warnings and instructions provided with this product.
- Meet or exceed your employer's safety practices.

Not liable

In no event shall Yokogawa be liable for any indirect, special, incidental, consequential, or punitive damages or for any lost profits arising out of or relating to any services provided by Yokogawa or its affiliates.

It is not possible for Yokogawa to identify all foreseeable uses or misuses, therefore all persons involved in commissioning, using, or maintaining this product must satisfy their self that each intended application is acceptable.

Safety Symbols

The following table defines the safety symbols, signal words, and corresponding safety messages used in the manual. These symbols:

- Identify potential hazards.
- Warn you about hazards that could result in personal injury or equipment damage.

Safety Symbols	Explaining the symbols
	This is the Read Instruction Manual symbol. This symbol indicates that you must read the instruction manual.
	This is the Safety Alert symbol. This symbol indicates a WARNING. Warnings alert you to actions that can cause personal injury or pose a physical threat. Please read these carefully.
	This is the Safety Glasses symbol. This symbol indicates that you must wear approved safety glasses during the task.
	This is the Safety Gloves symbol. This symbol indicates that you must wear approved safety gloves during the task.
	Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
	Indicates information essential for proper product installation, operation or maintenance.

ATEX Documentation

The information on the following two pages only applies to countries in the European Union.

GB

All instruction manuals for ATEX Ex related products are available in English, German and French. Should you require Ex related instructions in your local language, you are to contact your nearest Yokogawa office or representative.

DK

Alle brugervejledninger for produkter relateret til ATEX Ex er tilgængelige på engelsk, tysk og fransk. Skulle De ønske yderligere oplysninger om håndtering af Ex produkter på eget sprog, kan De rette henvendelse herom til den nærmeste Yokogawa afdeling eller forhandler.

I

Tutti i manuali operativi di prodotti ATEX contrassegnati con Ex sono disponibili in inglese, tedesco e francese. Se si desidera ricevere i manuali operativi di prodotti Ex in lingua locale, mettersi in contatto con l'ufficio Yokogawa più vicino o con un rappresentante.

E

Todos los manuales de instrucciones para los productos antiexplosivos de ATEX están disponibles en inglés, alemán y francés. Si desea solicitar las instrucciones de estos artículos antiexplosivos en su idioma local, deberá ponerse en contacto con la oficina o el representante de Yokogawa más cercano.

NL

Alle handleidingen voor producten die te maken hebben met ATEX explosiebeveiliging (Ex) zijn verkrijgbaar in het Engels, Duits en Frans. Neem, indien u aanwijzingen op het gebied van explosiebeveiliging nodig hebt in uw eigen taal, contact op met de dichtstbijzijnde vestiging van Yokogawa of met een vertegenwoordiger.

SF

Kaikkien ATEX Ex -tyyppisten tuotteiden käyttöohjeet ovat saatavilla englannin-, saksan- ja ranskankielisinä. Mikäli tarvitsette Ex -tyyppisten tuotteiden ohjeita omalla paikallisella kielellänne, ottakaa yhteyttä lähimpään Yokogawa-toimistoon tai -edustajaan.

SK

Všetky návody na obsluhu pre prístroje s ATEX Ex sú k dispozícii v jazyku anglickom, nemeckom a francúzskom. V prípade potreby návodu pre Ex-prístroje vo Vašom národnom jazyku, skontaktujte prosím miestnu kanceláriu firmy Yokogawa.

CZ

Všechny uživatelské příručky pro výrobky, na něž se vztahuje nevybušné schválení ATEX Ex, jsou dostupné v angličtině, němčině a francouzštině. Požadujete-li pokyny týkající se výrobků s nevybušným schválením ve vašem lokálním jazyku, kontaktujte prosím vaši nejbližší reprezentační kancelář Yokogawa.

LT

Visos gaminių ATEX Ex kategorijos Eksploatavimo instrukcijos teikiami anglų, vokiečių ir prancūzų kalbomis. Norėdami gauti prietaisų Ex dokumentaciją kitomis kalbomis susisieki su artimiausiu bendrovės "Yokogawa" biuru arba atstovu.

LV

Visas ATEX Ex kategorijas izstrādājumu Lietošanas instrukcijas tiek piegādātas angļu, vācu un franču valodās. Ja vēlaties saņemt Ex ierīšu dokumentāciju citā valodā, Jums ir jāsazinās ar firmas Jokogava (Yokogawa) tuvāko ofisu vai pārstāvi.

EST

Kõik ATEX Ex toodete kasutamisujuhendid on esitatud inglise, saksa ja prantsuse keeles. Ex seadmete muukeelse dokumentatsiooni saamiseks pöörduge lähima lokagava (Yokogawa) kontori või esindaja poole.

PL

Wszystkie instrukcje obsługi dla urządzeń w wykonaniu przeciwwybuchowym Ex, zgodnych z wymaganiami ATEX, dostępne są w języku angielskim, niemieckim i francuskim. Jeżeli wymagana jest instrukcja obsługi w Państwa lokalnym języku, prosimy o kontakt z najbliższym biurem Yokogawy.

ATEX Documentation (continued)

P

Todos os manuais de instruções referentes aos produtos Ex da ATEX estão disponíveis em Inglês, Alemão e Francês. Se necessitar de instruções na sua língua relacionadas com produtos Ex, deverá entrar em contacto com a delegação mais próxima ou com um representante da Yokogawa.

F

Tous les manuels d'instruction des produits ATEX Ex sont disponibles en langue anglaise, allemande et française. Si vous nécessitez des instructions relatives aux produits Ex dans votre langue, veuillez bien contacter votre représentant Yokogawa le plus proche.

D

Alle Betriebsanleitungen für ATEX Ex bezogene Produkte stehen in den Sprachen Englisch, Deutsch und Französisch zur Verfügung. Sollten Sie die Betriebsanleitungen für Ex-Produkte in Ihrer Landessprache benötigen, setzen Sie sich bitte mit Ihrem örtlichen Yokogawa-Vertreter in Verbindung.

S

Alla instruktionsböcker för ATEX Ex (explosionssäkra) produkter är tillgängliga på engelska, tyska och franska. Om Ni behöver instruktioner för dessa explosionssäkra produkter på annat språk, skall Ni kontakta närmaste Yokogawakontor eller representant.

GR

Όλα τα εγχειρίδια λειτουργίας των προϊόντων με ATEX Ex διατίθενται στα Αγγλικά, Γερμανικά και Γαλλικά. Σε περίπτωση που χρειάζεστε οδηγίες σχετικά με Ex στην τοπική γλώσσα παρακαλούμε επικοινωνήστε με το πλησιέστερο γραφείο της Yokogawa ή αντιπρόσωπο της.

SLO

Vsi predpisi in navodila za ATEX Ex sorodni pridelki so pri roki v angleščini, nemščini ter francoščini. Če so Ex sorodna navodila potrebna v vašem tujejnem jeziku, kontaktirajte vaš najbliži Yokogawa office ili predstavnika.

H

Az ATEX Ex műszerek gépkönyveit angol, német és francia nyelven adjuk ki. Amennyiben helyi nyelven kéri az Ex eszközök leírásait, kérjük keressék fel a legközelebbi Yokogawa irodát, vagy képviselőt.

BG

Всички упътвания за продукти от серията ATEX Ex се предлагат на английски, немски и френски език. Ако се нуждаете от упътвания за продукти от серията Ex на родния ви език, се свържете с най-близкия офис или представителство на фирма Yokogawa.

RO

Toate manualele de instructiuni pentru produsele ATEX Ex sunt in limba engleza, germana si franceza. In cazul in care doriti instructiunile in limba locala, trebuie sa contactati cel mai apropiat birou sau reprezentant Yokogawa.

M

Il-manwali kollha ta' l-istruzzjonijiet għal prodotti marbuta ma' ATEX Ex huma disponibbli bil-Ingliż, bil-Ġermaniż u bil-Franċiż. Jekk tkun teħtieġ struzzjonijiet marbuta ma' Ex fil-lingwa lokali tiegħek, għandek tikkuntattja lill-eqreb rappreżentant jew ufficiju ta' Yokogawa.

Contents

Safety Information.....	2
ATEX Documentation.....	3
ATEX Documentation (continued)	4
Contents	5
Trademarks.....	8
Yokogawa Contact Information	9
Definitions for Terminology	10
Definitions for terminology (continued).....	11
Definitions for terminology (continued).....	12
Installing or removing the battery pack.....	13
Charging the battery pack.....	14
Memory System Card.....	14
Memory System Card (continued)	15
YHC5150X Series HART Communicator Overview.....	15
Overview (continued).....	16
Keyboards – touchscreen and dedicated	17
Touchscreen – System menus	17
Touchscreen – HART menus	18
YHC5150X Operating Instructions	19
Power key functions	19
Backlight—reducing intensity.....	20
Backlight—settings for timeout	21
Standby—settings for timeout.....	22
Timeout—Backlight and Standby are cumulative.....	23
The battery pack life	23
The battery pack life (continued).....	24
The charging cradle.....	25
The charging cradle (continued)	26
Kickstand—useful for viewing the display	26
Loop Communication Jacks & Field-wiring practices	27
Keyboard overview	28
Keyboard functions.....	29

Keyboard functions (continued)	30
Keyboard – the on-screen keyboard	30
Keyboard – the on-screen keyboard	31
Limited character sets	32
Limited number of characters	33
Navigating in the screen	33
Navigating the keysets	34
Touchscreen – Keypad #1	34
Touchscreen – Keypads #2-5	35
Navigating the Communicator	36
Navigating the Communicator (continued)	37
HART navigation and connection status	38
HART connection status	39
HART list of found HART devices	40
Main system menus	41
System Setup Menu	42
Date/Time Setup – System menu	43
Power Setup – System Menu	44
Language Selection – System Menu	45
Language Selection – Displayed	46
Language Selection – Displayed (continued)	47
Calibrating the touchscreen– System Menu	47
System Information – System Menu	48
HART Setup Menu	49
Shifting the highlight in HART menus	50
Shifting the highlight in HART menus (continued)	51
Status Line for the connecting device	52
DD files control HART menus	53
Function buttons in HART menus	54
Function buttons: Explaining the buttons	55
Function buttons: More buttons	56
Creating Shortcuts	57
Creating Shortcuts: Invalid shortcuts	58
HART menu path bar	58

Advanced Tools for HART: Two Option buttons	59
Advanced Tools for HART: DD Browser	60
Advanced Tools for HART: View device names and revisions	61
Advanced Tools for HART: Offline Configuration	62
Advanced Tools for HART: Offline Configuration	63
Advanced Tools for HART: Waiting for the Offline Configuration	64
Advanced Tools for HART: Indicators in Offline Configuration	65
Advanced Tools for HART: Function buttons	66
HART Communication with the YHC5150X Series	67
Connecting the YHC5150X to Smart Transmitters with HART technology	68
Loop resistance > 250 Ω	69
Polling: HART Communication	70
Polling: HART Communication (continued)	71
Specific and Generic HART communication	72
Managing Configuration Files	73
Managing Configuration Files (continued)	74
Managing Configuration Files (continued)	75
Managing Configuration Files (continued)	76
Troubleshooting HART Communications	77
Troubleshooting HART Communications (continued)	78
Updating communicator software	78
Hazardous area use	79
Hazardous area - Warnings & Cautions	80
Returning for repair	81
Appendices	82
Product Specifications	82
Safety notices	83
Waste Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC	84
Spare parts list	85
Intrinsic Safety Control Drawing	86

Trademarks

HART Communication Foundation

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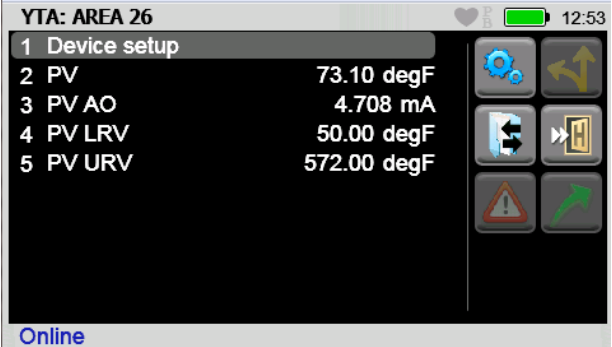
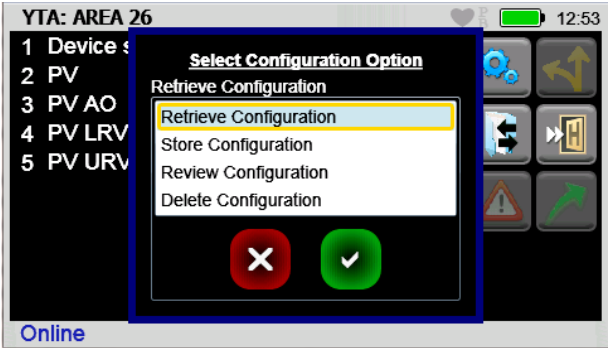
Yokogawa Contact Information

For customer Assistance	
Address	Yokogawa Corporation of America 2 Dart Road Newnan, GA. 30265USA
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Website	www.yokogawa.com/us
	Information in this document is subject to change without notice. Check the Yokogawa web site for latest manual revision: http://www.yokogawa.com/us/products/field-instruments/ia-smart-communicators/yhc5150x.htm
HART Communication Foundation	
HART website	For more information regarding the HART Communication Foundation topics, go to www.hartcomm.org

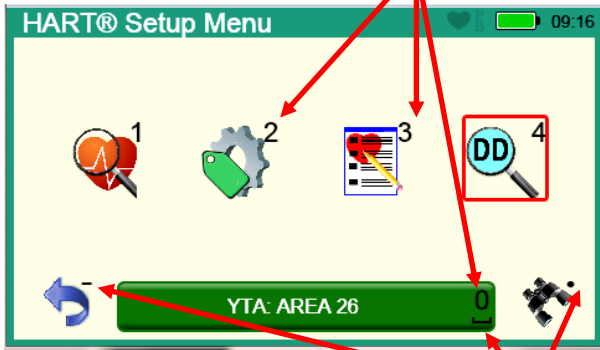
Definitions for Terminology

Terminology	Definitions
Button or key	<ul style="list-style-type: none"> • A <i>button</i> always refers to an area on the screen that you can tap to select functionality. • A <i>key</i> always refers to hardware push-buttons on the keyboard that you can press.
DD or Device Description files	<p>Manufacturers create HART® compliant Device Description (DD) files that reside on the YHC5150X. You may need to check for updates to the DD files from time to time.</p> <ul style="list-style-type: none"> • DD files “<i>provide a standardized method for host systems to access and display valuable parameters located in field instruments so that the full capability of the device can be accessed via the HART protocol.</i>” • DDs are “<i>used to describe such parameters as device diagnostics, multi-variable measurements and device configuration information in a digital format. As applied in the HART Protocol, this digital information is imposed on top of the industry-standard, process control 4-20mA signal.</i>” <p>Note: The two italicized statements come from the HART Communication Foundation’s web site: http://en.hartcomm.org/hcp/tech/dd/aboutprotocol_dd.html</p>
Highlight	<p>This manual uses the word <i>highlight</i> in two ways:</p> <ol style="list-style-type: none"> 1. As a noun: <i>highlight</i> refers to an icon or a menu line that has the focus on-screen at any given time. 2. As a verb: <i>highlight</i> refers to: <ol style="list-style-type: none"> a. Pressing the arrow keys or Advance key to change the focus to a new button. b. Pressing and holding a button on-screen for one second to change the focus to a new button.

Definitions for terminology (continued)

Terminology	Definitions
<p>Highlight colors</p>	<p>Highlights appear in three colors: <i>red</i>, <i>gray</i>, and <i>yellow</i>.</p> <ul style="list-style-type: none"> • A red rectangle appears in: <ul style="list-style-type: none"> ○ System menus.  <ul style="list-style-type: none"> • A gray highlight appears in: <ul style="list-style-type: none"> ○ The HART Navigation pane.  <ul style="list-style-type: none"> • A yellow border appears in: <ul style="list-style-type: none"> ○ Selection boxes when an item is selected. ○ The HART Function button pane. ○ The HART menu path bar. 

Definitions for terminology (continued)

Terminology	Definitions
<p>Select</p>	<p>This manual uses the word <i>select</i> to refer to:</p> <ul style="list-style-type: none"> • Navigating the levels of menus in the communicator. • Opening additional screens: <ul style="list-style-type: none"> ○ To navigate the communicator’s menu levels. ○ To view information. ○ To view additional functions. • Performing some task on the communicator. <p>Note: Highlight an on-screen button you want to choose and select it.</p> <p>You may <i>select</i> items by using one of several methods:</p> <div style="text-align: center;"> <p>Navigation numbers</p>  <p>Navigation shortcuts</p> </div> <ul style="list-style-type: none"> • Touchscreen gestures as you do on a smartphone, such as: <ul style="list-style-type: none"> ○ Tapping on-screen buttons or icons. ○ Swiping left or right. ○ Scrolling up or down. • Navigation keys use: <ul style="list-style-type: none"> ○ The Arrows and Advance/Switch buttons to highlight a button. ○ The Select button to select the highlighted button. • Numeric keys: <ul style="list-style-type: none"> ○ 1-9 and 0, minus and decimal. ○ These Navigation shortcuts select the function directly. • A combination of touchscreen gestures and keys. <p>Note: The Spacebar is used as a shortcut key only on system menus. Since it is directly above the Navigation keys, it offers an easy way to select the connection bar.</p>
<p>Standby or sleep</p>	<p>This manual uses the word <i>standby mode</i> to describe putting the communicator into an energy-saving mode, where it uses very little power. Some use the word <i>sleep mode</i> instead of <i>standby</i>.</p>

Installing or removing the battery pack

Installing the battery

To install the battery pack:

1. Set the communicator enclosure with the display downward on a flat, stable surface.
2. Rest the battery pack in the battery pack compartment of the enclosure.
3. Leave a ½ in. gap (or 1.27 cm) between the battery pack and the connector on the communicator enclosure.
4. Slide the battery pack inside the enclosure until the connectors mate completely and the screws align with the threaded inserts on the communicator body.

Note: Two standard 6-32 screws hold the battery pack in the communicator. These screws are a part of the battery pack. They have hexagonal sockets that require a 7/64 in. hex key wrench.

5. Thread the screws into the inserts to complete the installation.

Note: The 7/16 in. hex key wrench is included with the unit.

NOTICE

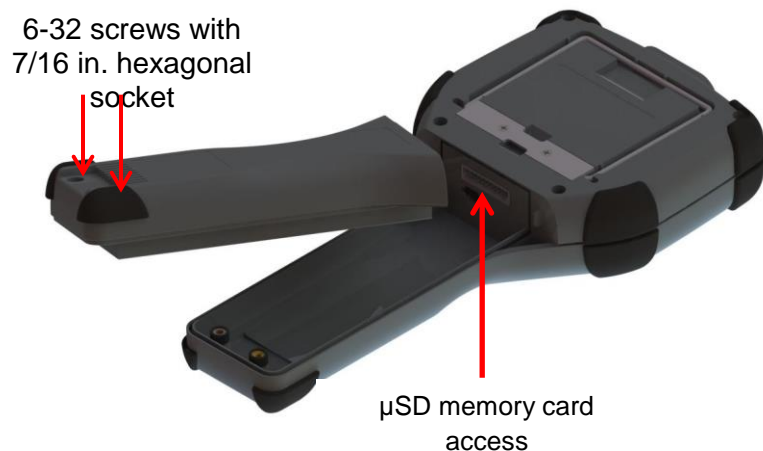
Don't over tighten

Do not over tighten the screws when you install the battery pack. Over tightening screws can cause damage the communicator.

Note: Maximum torque should not exceed seven (7) in-lb. (or 0.79 N-m).

Removing the battery

Reverse the order of the steps in the *Installing a battery* section above.



Charging the battery pack

NOTICE

Charge 10 hours

Charge the battery completely for 10 hours before first use. See the sections about [The charging cradle](#) for more detail.

Memory System Card

Uses for the memory card

The communicator is shipped with a μ SD memory system card. This system card is necessary for the following uses:

- Storage of required software.
- Software updates.
- HART DD files.
- Device configuration files.

Use only with the YHC5150X

The μ SD memory system card is not intended for use unrelated to the operation of the communicator. The YHC5150X Series System card **must** be installed to operate the communicator.

Note: While the μ SD memory system card is in the YHC5150X, there is no way to access the card except with the Yokogawa provided computer software.

NOTICE

Replace with Yokogawa 1W-9P780

If you need to replace the μ SD card, it must be replaced with part number **1W-9P780** or the successor part number specified by Yokogawa.

- Replace the card only under the direction of Yokogawa personnel.
- Use of a non-system memory card voids the **Intrinsic Safety Compliance**.

Installing & removing battery pack

To remove and to replace the memory system card you must remove the battery first. See the [Installing or removing the battery pack](#) section for more details.

Removing the memory card

Once you have removed the battery pack:

1. Press gently on the memory card to unlock it from the cardholder.
2. Carefully remove the memory card from the enclosure.

Note: Tweezers or small needle-nose pliers can be helpful in removing and inserting memory cards - apply gentle pressure only.

Memory System Card (continued)

Replacing the Memory Card

Once you have removed the memory system card:

1. Insert the new memory card carefully into the cardholder. Verify the contacts are facing toward the back of the communicator and card label facing towards the front (screen side) of the communicator.
2. Be sure the memory card is resting in the holder before releasing it.
3. Gently press the card into the holder to lock it into place.
4. Install the battery pack and secure it to the communicator enclosure.

YHC5150X Series HART Communicator Overview

Full function HART

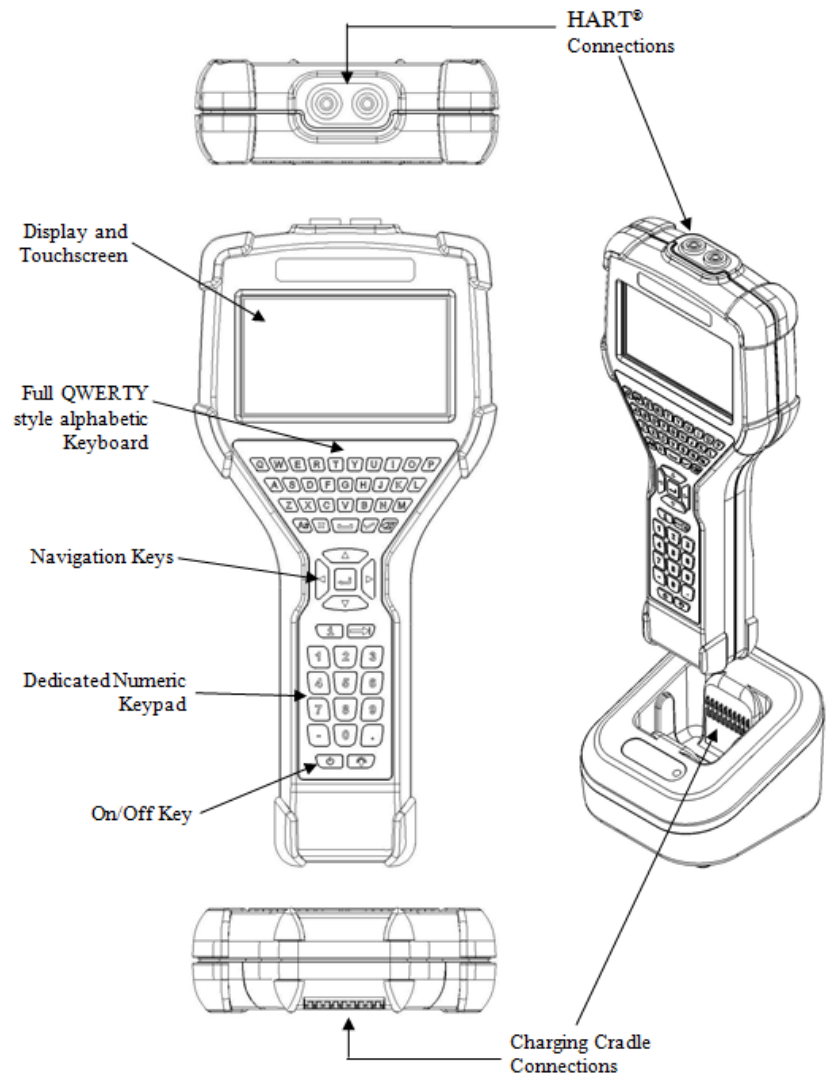
The YHC5150X Series HART Communicator is a full function HART Communicator supporting HART communication:

- Universal.
- Common Practice.
- Device Specific commands.

Note: These commands allow you to commission, configure, and maintain operations.

Overview (continued)

Diagram of the YHC5150X



Keyboards – touchscreen and dedicated

Touchscreen – System menus

Touchscreen - Display details

The communicator has a 4.3-in. (10.9 cm) widescreen, backlit, TFT color touchscreen display:

- It has a 480 x 272 WQVGA pixel resolution.
- The entire viewable area of the screen is an active touch surface.
- The touchscreen responds to and is optimized for finger presses - even when you are wearing gloves.

Important:

- **No** stylus is necessary.
- **Never** tap the screen with sharp objects – simply use your finger.

Touchscreen - Two menu systems

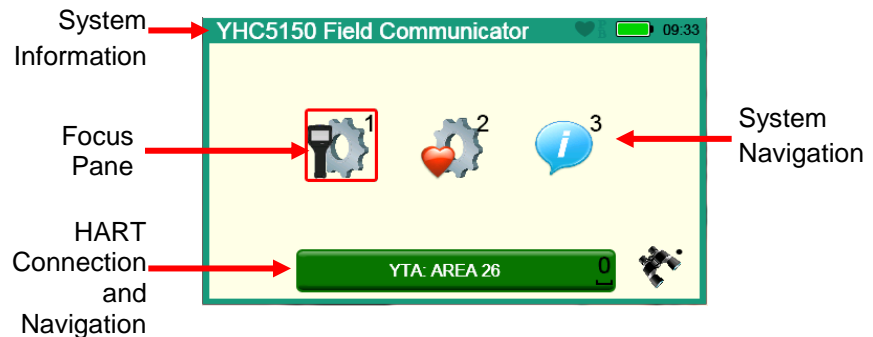
The communicator displays two types of menus:

- System menus.
- HART menus.

Touchscreen - System menu

The system menu displays after you press the **Power** key. You can switch to the system menu from any HART menu. There are three distinct areas on the system menu:

- The **top** of the menu provides system information.
- The **middle** of the menu contains navigation icons to system actions or new system menus.
- The **bottom** of the menu contains current HART connection status and navigation buttons.



Sample system display

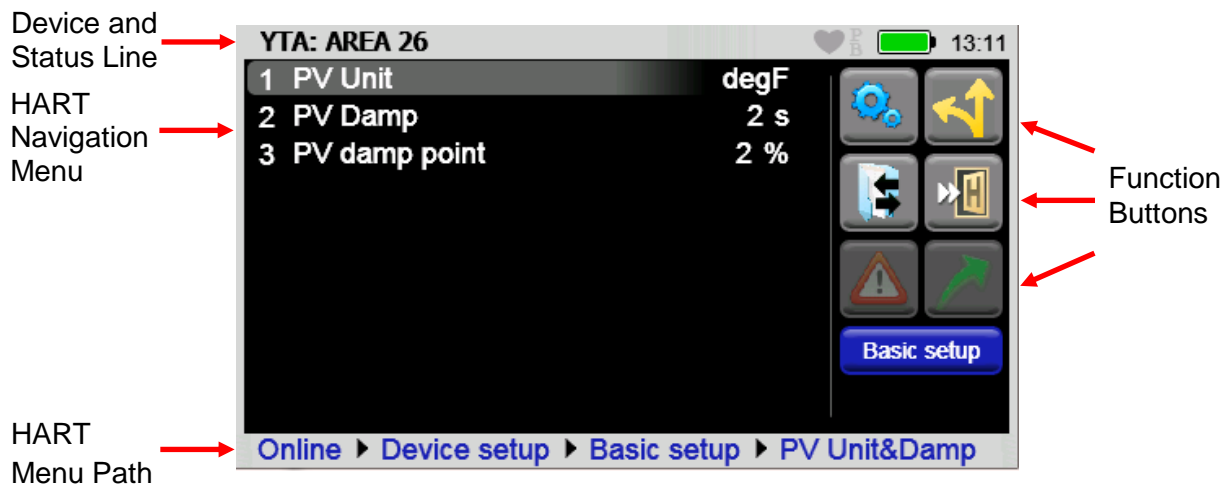
Touchscreen – HART menus

HART menus appear when connected to HART devices

The HART menus are only available when a HART communication enabled device is connected and communicating with the communicator. There are four distinct areas on a HART menu:

- The **top** of the menu provides information on the currently attached device as well as various status indicators.
- The **middle** of the menu is divided into two functional areas:
 - HART Menu navigation
 - Function buttons.
- The **bottom** of the menu contains the HART Menu Path bar.

Sample HART menu display



YHC5150X Operating Instructions

Power key functions

Turn on

When you press and hold the **Power** key for two seconds, the communicator launches a complete system start sequence:

- The first screen displays the FieldMate logo.
- The second screen displays a white screen with a list of drivers loading.
- The third screen displays the date and time.
- Now the communicator is ready to use.

Standby

When you press the **Power** key and release, the communicator enters the standby mode (sometimes referred to as sleep mode):

- The screen is off and the communicator ignores most user input to conserve battery power.
- The on-board computer maintains the previous system state of functionality to resume quickly.
- Do not use the standby mode as a substitute for turning off the unit for extended periods of time.

Resume

When you press the **Power** key and release, the communicator quickly resumes operation from being in Standby:

- It returns to the exact state of functionality that it was in before entering standby.
- From the Power Setup Menu, users can enter a specific time for the unit to automatically enter the standby mode to conserve battery power.

Turn off

When you hold the **Power** key until the screen turns off, the communicator is turned off:

- We recommend turning off the communicator as the best way to conserve battery life.

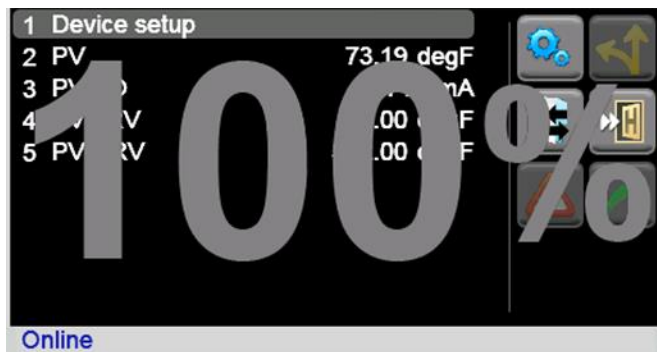
Note: The batteries will lose some power while not in use. For this reason, we recommend keeping the communicator in the charging cradle when not in use.

Backlight—reducing intensity

Pressing the Backlight key

The **Backlight** key allows you to choose one of five levels of intensity: 20%, 40%, 60%, 80%, and 100% brightness. You can press the **Backlight** key while on any screen.

- Press the **Backlight** key and release it to display the current percent of backlight in use.
- Press it again within two seconds to change the intensity level to the next level.
- Continue to press it to set the intensity level you want.



Reducing intensity improves battery life

The following table presents the estimated savings using the various backlight levels.

Backlight intensity at:	While the communicator is on, the battery life is improved by:
20%	Up to 80%
40%	Up to 50%
60%	Up to 30%
80%	Up to 12%

Backlight—settings for timeout

Changing the timeout setting to save battery life

By default, the **Backlight** is set to *never* timeout.

- The *never* timeout setting can reduce your battery's life.
- You can change the setting to reduce the backlight intensity to 10% after 30 seconds, 1, 2, 3, 4, 5, or 10 minutes.
- Tap the screen or press a key to return to the previous level of intensity.

Navigating to the timeout settings

From the **Main System** screen:

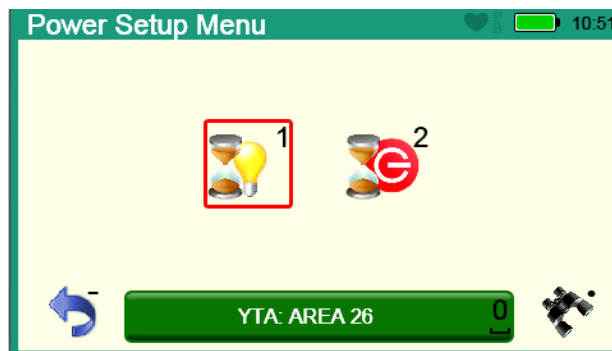
1. Select the **System Setup** icon.



2. Select the **Power Management** icon.



3. Select the **Backlight timeout settings** icon.



Standby—settings for timeout

Change the timeout settings to save battery life

By default, the communicator is set to *never* timeout.

- The *never* setting can reduce your battery's life.
- You can choose to configure the setting to automatically enter standby mode after being inactive for 3, 4, 5, 10, or 15 minutes.
- Select the **Standby timeout settings** icon to change the timeout setting.

Navigating to the Standby timeout settings

From the **Main System** screen:

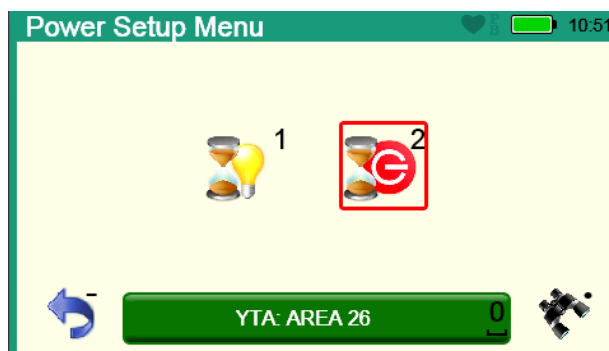
1. Select the **System Setup** icon.



2. Select the **Power Management** icon.



3. Select the **Standby timeout settings** icon. See the following screen shot.



Timeout—Backlight and Standby are cumulative

An example of the cumulative timeouts

- The **Standby** timeout period does not start until the **Backlight** period has timed out.
- To determine the amount of time before a communicator automatically enters Standby mode, you must add the timeout settings for Backlight and Standby together.

If...	Then...
You set the Backlight timeout to 30 seconds	<ul style="list-style-type: none">• After the communicator is out of the cradle and it has no input for 30 seconds,• The communicator reduces the intensity to 10%.
You set the Standby timeout to 3 minutes	<ul style="list-style-type: none">• 3 minutes and 30 seconds after the start of the Backlight timeout,• The communicator enters Standby mode.

The battery pack life

Keep charging it

We strongly recommend putting the communicator in the charging cradle whenever you are not using it. This is the easiest way:

- To conserve battery life.
- To increase the overall number of battery charge cycles.



YHC5150X
in the charging cradle

The battery pack life (continued)

For portable use

A rechargeable lithium-ion battery pack powers the communicator for portable use. A fully-charged battery typically allows for:

- 10 hours of continuous operation.
- 40 hours while in the standby mode.

Note: See the section for [Installing or removing the battery pack](#).

Note: Order part number **1W-9A820-1** from Yokogawa to replace the battery pack.

NOTICE

Advanced battery fuel gauge

The battery pack contains an advanced battery fuel gauge that actively monitors the battery capacity. It, therefore, does not require any *battery conditioning* throughout the life of the battery.

The charging cradle

Cradle connection details

Look at the back of the cradle:



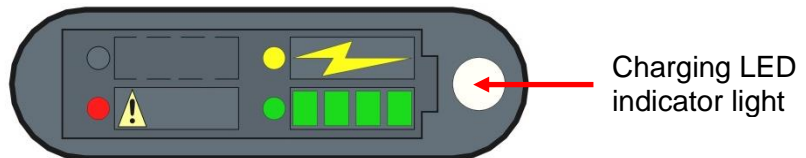
Automatically recharges

Each communicator includes a charging cradle and power adapter. The cradle automatically recharges the lithium-ion battery when the communicator is properly inserted into it.

Note: To fully recharge a depleted battery takes about six hours.

Charging indicator

There is a multicolor LED on the front of the charging cradle. This LED indicates the current charging mode.



Light Status	Indicates...
Off	The communicator has not been correctly inserted or the power is disconnected.
Solid Green	The battery is fully recharged.
Flashing Amber	The battery is charging.
Solid Amber	The battery temperature is out of the charging range. The charging process has been suspended.
Flashing Red	There is a battery fault.
Solid Red	There is a charging fault.

Connecting to a computer

You need to connect the USB cable to the charging cradle and to a computer to update files. The communicator must be in the cradle and turned on to update files.

Note: See the section for [Updating communicator software](#).

The charging cradle (continued)

NOTICE

Insert the communicator not the battery

The charging cradle is not intended to recharge a battery itself. To properly recharge a battery pack, you must insert the battery into the communicator before placing it into the charging cradle.

WARNING

Not intrinsically safe

The charging cradle is not rated for intrinsic safety.

- You must use it in *non-hazardous areas only*.

Note: See the [Hazardous area use](#) section of this manual for more details.

Note: See the [Intrinsic Safety Control Drawing](#) in the **Appendix** of this manual for more details.

Kickstand—useful for viewing the display

Better angle to view the display

The communicator is equipped with a kickstand to provide a better viewing angle than when it lays flat on a table.

- To open the kickstand pull it down until it snaps into the open position.
- To close the kickstand squeeze the base inwards from both sides to unlatch it and pull it down until it snaps into the closed position
- See the yellow arrows in the following figure.



Loop Communication Jacks & Field-wiring practices

Loop Communication Jacks

Loop Communication Jacks or Lead Set:

- All YHC5150X models are equipped with a standard size banana jacks on 0.75 in. or 1.9 cm center.
- The lead set supplied with the communicator has a standard banana plug on one end and mini-grabbers on the other for convenient connections.



WARNING

Field-wiring practices

For the Intrinsically Safe model YHC5150X:

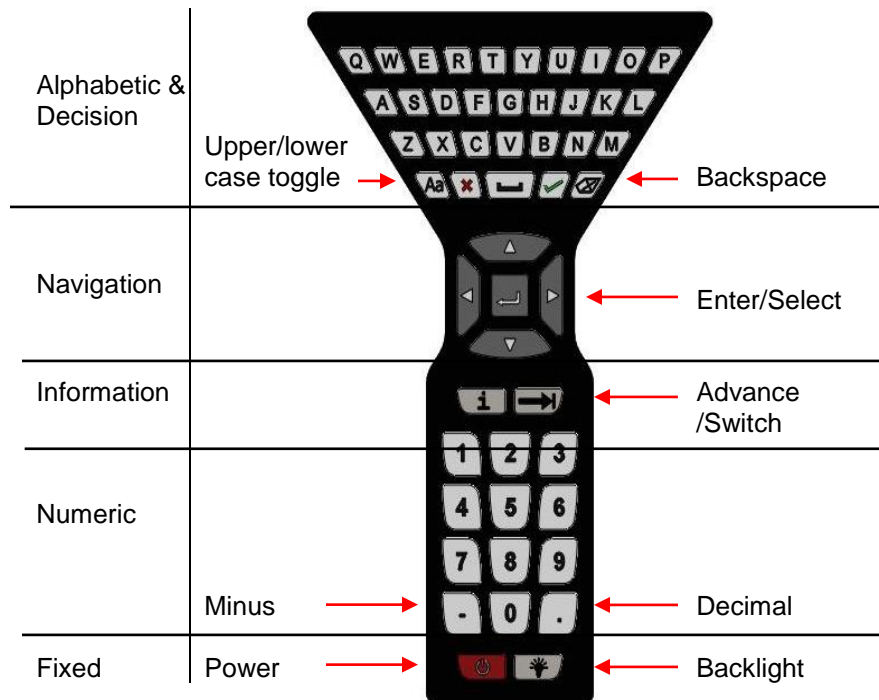
- Verify that the instruments you want to use in the loop are installed in accordance with intrinsically safe field-wiring practices before making a connection from the field device to the communicator's loop communication jack.
- See the [Hazardous area use](#) section of this manual.
- See the [Intrinsic Safety Control Drawing](#) in the *Appendix* for more information.

Keyboard overview

Arranged by frequency of use

The keyboard is arranged into four areas based on the frequency of use.

- **Most frequently used keys:**
 - The navigation.
 - The numeric keys.
- **Less frequently used keys:**
 - The alphabetic.
 - The fixed function keys.



Alphabetic keys

The alphabetic keys are arranged in the same order as a standard QWERTY keyboard. The alphabetic keys are used for:

- Text data entries as well as
- Hexadecimal (A to F) numeric data entries.

Note: When you are not entering data, the input from these keys is ignored.

Keyboard functions




Decision keys & buttons

Decision keys on the keyboard become active when decision buttons appear on the screen. Decision keys function the same way as the decision buttons.

Note: See the section [Creating Shortcuts](#) for more details.

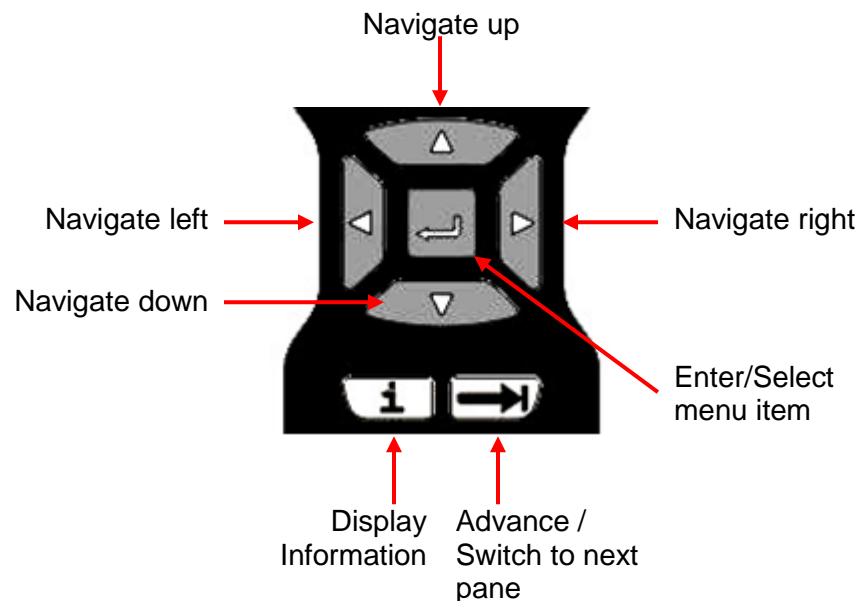
Note: Decision keys are also used for some subordinate operations related to the functions buttons. See [Function buttons in HART menus](#).

Note: See the decision keys and touchscreen buttons in the following table.

Decision	Key	Touchscreen button
Cancel or Esc		
Accept		

Navigation & Information

Use the navigation keys to move the highlight around on-screen and to select the item that is highlighted.



Note: the **Display Information** key displays HART information where that is provided by the DD file.

Note: See the section [Shifting the highlight in HART menus](#) for more information about the **Advance/Switch** key.

Keyboard functions (continued)

Numeric keys

Numeric keys are used:

- To enter numeric data.
- To advance menus and initiate actions when indicated by the on-screen icons.

Fixed function keys

These include the **Power** key and the **Backlight** key.

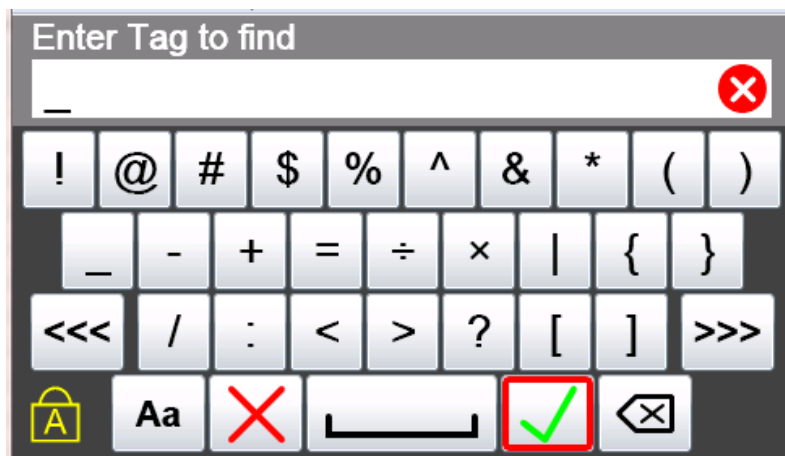
- See the section for [Power key functions](#).
- See the section for [Backlight—reducing intensity](#).

Keyboard – the on-screen keyboard

Use both the dedicated and on-screen keyboards

When you combine the functionality of the dedicated keyboard with the touchscreen data keys, you can simplify data entry and navigation. The touchscreen buttons:

- Appear only during text data entry.
- Appear in a large, easy to select key size.
- Add the complete ISO Latin-1 (ISO 8859-1) character set, except for numerals.



Keyboard – the on-screen keyboard

ISO Latin-1 character set

The YHC5150X Series and HART communication support the ISO Latin-1 character set for data entry.

- The ISO Latin-1 character set is also known as the ISO 8859-1 set.
- This character set has 181 characters in it.
- 181 characters are on the touchscreen keysets.
- Only 65 of these characters are on the dedicated keyboard.

181 characters on the touchscreen

181 characters are available on the touchscreen.

- The first touch keyset that appears on screen are commonly used symbols. See [Touchscreen – Keyset #1](#).
- The touch keysets are grouped more logically than the standard order of the ISO Latin-1 Character Set. Additionally, the touch keysets appear in an order based on estimated usage.
- Since the ISO basic Latin alphabet characters are on the dedicated keyboard, they are the last touch keyset. See [Touchscreen – Keysets #2-5](#).

65 characters on the dedicated keyboard

These 65 keys handle most data entry.

- 26 lowercase keys
- 26 uppercase keys
- 1 Caps Lock key
- 10 numeric keys
- 1 minus key
- 1 decimal key

Touchscreen buttons appear

- Whenever a text edit window appears, the touchscreen keyboard becomes visible.
- The touchscreen keysets offer larger buttons than the keyboard for easier typing.

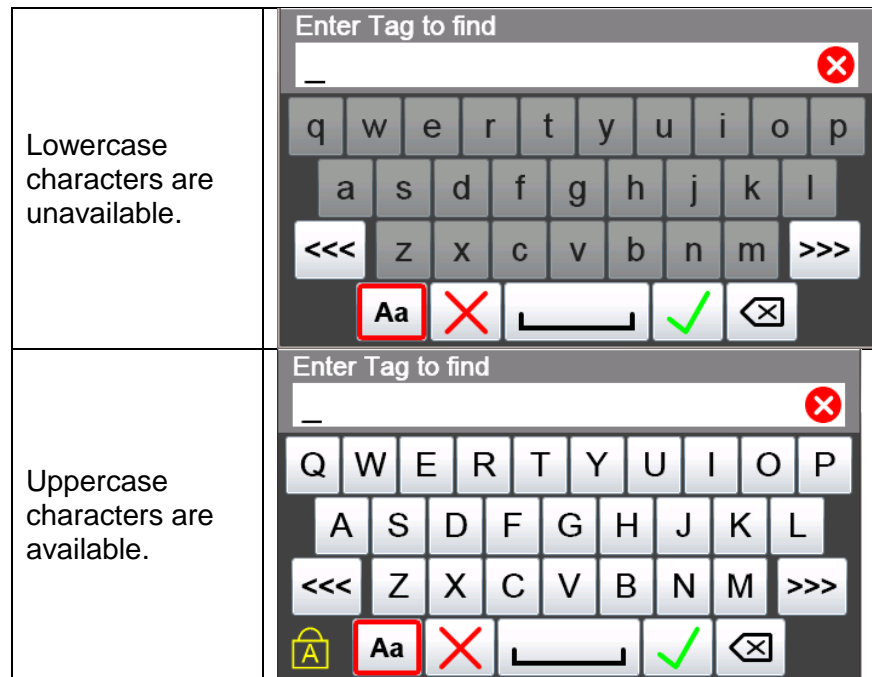
Limited character sets

Buttons and keys are unavailable

Some data parameters do not support the full ISO Latin-1 character set.

For example: The **Find short tag** screen has a limited character set. This means:

- The non-functioning touchscreen buttons appear dimmed.
- The lowercase alphabetic keys do not work.
- Select the **Caps Lock** to use the uppercase characters.



↑ ↑
A Caps Lock symbol appears next to the touchscreen **Caps Lock** button.

Limited number of characters

Yellow box appears

When characters entered in an edit box reach the size limit for a specific parameter, the cursor disappears and a yellow block appears after the last character. The communicator ignores any additional character entries.

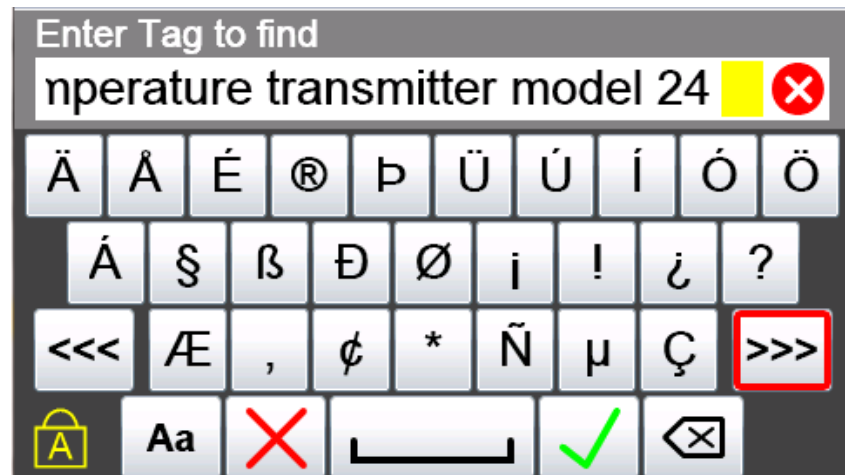
For example: The **Find short tag** edit box has an eight (8) character limit. As soon as you reach that limit, a yellow box appears. See the following screen shot.



Navigating in the screen

Viewing long text

Data entry always shifts the characters to the left as you type so the end of the entry is visible as in the following screen shot.



Swipe the text to view all of the text line

If the length of the data entry exceeds the viewable area on the screen, use your finger to swipe the characters to the right as you do on a smartphone. You can then swipe the characters back to the left. Compare the text in the following screen shot with the preceding screen shot.



Navigating the keysets

Navigating 181 keys

To move to other keysets use:

- The **Navigate to previous keyset** <<< touchscreen button
- The **Navigate to the next keyset** >>> touchscreen button.

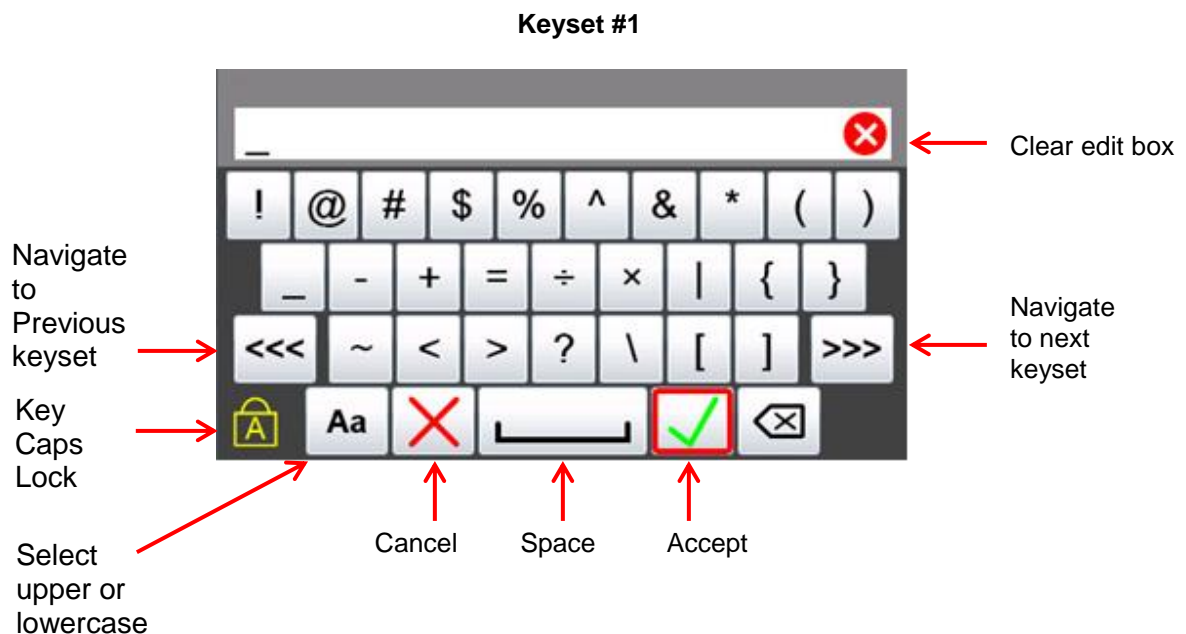
Caps Lock

Selecting the **Caps Lock** does not affect the symbols in keyset #1 or keyset #2 in the following pages.

Touchscreen – Keyset #1

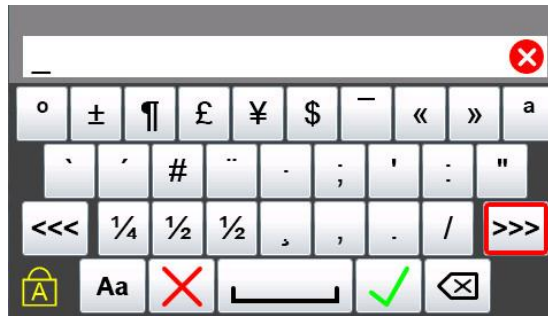
Diagram of Keyset #1

See the detailed diagram of the touchscreen keyboard in the following screen shot.



Touchscreen – Keysets #2-5

Keyset #2



Keyset #3 (uppercase)



Keyset #3 (lowercase)



Keyset #4 (uppercase)



Keyset #4 (lowercase)



Keyset #5 (uppercase)



Keyset #5 (lowercase)



Navigating the Communicator

System Menus

System menus provide access to information and to settings related to the operation of the communicator.

Communicator status line

The top of the system menus displays system information. You cannot use this area to navigate.



Navigating the Communicator (continued)

Communicator status line explained

The following table explains the different parts of the System Menu.

Status line	Function
Menu Information	This area displays the system menu. When you see YHC5150X FieldMate Communicator , you are at the top-level menu.
Communication Status	This displays if HART communication is active, whether there is a primary master (host) on the loop, and if there is a burst mode device active.
Battery Status	This gives you a quick reference to the current condition of the battery. There is more information available in System Information .
Current Time	The current time is set by you in the Date/Time Setup Menu

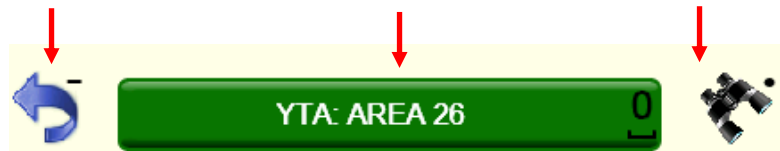
Using the bottom row of icons to navigate

The bottom area of the **HART Setup Menu** screen offers you three choices when connected to a HART device:

Go back to the previous menu

View the multifunction connection bar

Poll for other HART devices



Back key – go back to the previous system menu

Select the **Back** icon to navigate away from the current system menu back to the previous system menu:



HART navigation and connection status

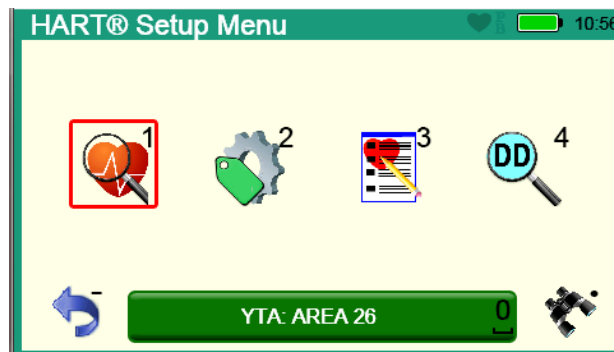
Navigating to the HART Setup Menu

From the **Main System** screen, select the **HART Setup** icon to see the HART Setup Menu screen displayed in the following section.



Viewing the HART Setup Menu and navigation options

The communicator displays the status of any HART connections and provides several ways to navigate.

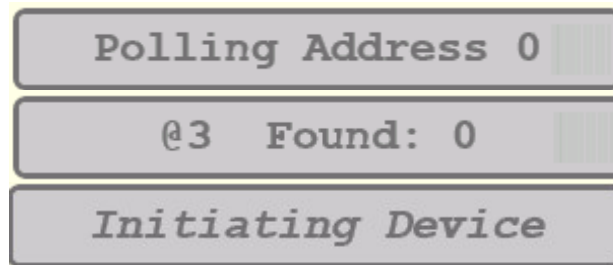


HART connection status

Gray connection bars

There are three occasions when the bar appears gray:

1. There is no device found: **Polling Address 0**.
2. There are no multidrop devices found: **@3 Found: 0**.
3. There is a device that is connecting: **Initiating Device**.



Note: If you select any of the gray bars, no action occurs.

Yellow connection bar

A yellow connection bar appears when searching for more than one polling address and found at least one device. (Multidrop)



Green connection bar

When the bar appears green, it indicates that a device is actively connected to the communicator. Select the green connection bar to display the HART menu system:



Restart polling

The green connection bar indicates a device is connected to the communicator. When you select the **Restart Poll** icon, two actions occur:

- A new poll search disconnects the established HART connection.
- A new poll search starts for devices in the poll address range set by the user.



HART list of found HART devices

Display a list of devices

If the HART connection status bar indicates there are multiple devices found, then select the connection bar to display a list of the connected devices. From the list of found devices:

- Select the device you want to connect, or
- Cancel this operation.



Main system menus




Connected main menu

This is the main communicator menu.



Main menu icons

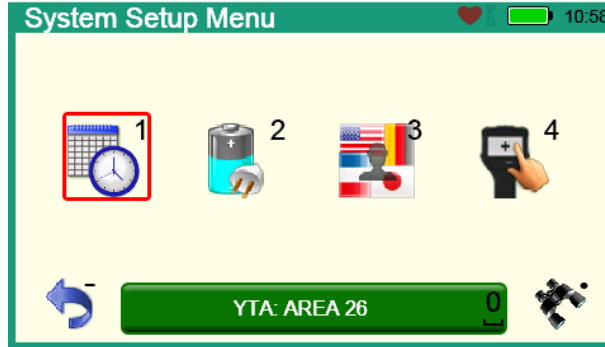
The following table lists the three main system icons and describes them:

Main System Icons	Icon Name	Description
	System Setup	Provides access to the system setup menus for changing communicator parameters.
	HART Setup	Provides access to the HART setup menus for changing HART specific parameters.
	System Information	Provides access to information regarding model number, serial number, battery level and so on.

System Setup Menu





System Setup menu icons

The following pages provide more information about each of the four icons in the System Setup Menu.



Descriptions of Setup icons

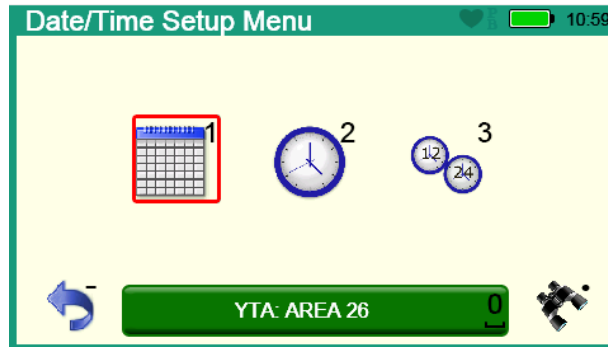
The following table lists the four **System Setup Menu** icons and describes them:

Setup Menu Icons	Icon Name	Description
 1	Date & Time Setup	You can set the current date and time for timestamps on files and system indicators.
 2	Power Management	You can adjust settings for power usage (backlight and standby timers).
 3	Language	You can select the preferred language.
 4	Touchscreen Calibration	You can calibrate the touchscreen.

Date/Time Setup – System menu




Date/time Setup

This is the **Date/Time Setup Menu** screen.



Date/Time Menu Icons

The following table lists the three **Date/Time Menu** icons and describes them:

Date/Time Menu Icons	Icon Name	Description
	Date	You can adjust the system day, month and year.
	Time	You can adjust the system minutes and hour.
	12-hour or 24-hour mode	You can choose 12-hour or 24-hour time for display.

Power Setup – System Menu



Power Setup Menu

Power Setup Menu displays two icons.



Power Setup Icons

The following table lists the two **Power Setup Menu** icons and describes them:

Power Setup Menu Icons	Icon Name	Description
	Backlight Timeout	You can set the timeout to automatically reduce the backlight to the minimum setting (10%) during periods of inactivity.
	Standby Timeout	You can set the timeout to automatically switch the system to standby mode during periods of inactivity.

Language Selection – System Menu

Display available languages

Select this icon to display a list of available languages. You can change the language that is be used for all System menus.



Important: The languages that display are used for the System menus and for HART menus when supported by the DD file.

Select your language

From the list of available languages:

- Highlight the language that you want to use.
- Select **Accept**.

Note: Select **Cancel** to avoid making a selection



Language Selection – Displayed

Turn off and Turn on

Once you have selected a new language, you **must** turn off the communicator and then turn it on to see new language settings take effect.



Note: You may see some menus immediately change language before you turn the communicator off.

New language displayed

In the following example, French is displayed in a HART menu and on the HART menu path bar.



Language Selection – Displayed (continued)

NOTICE

Some screens not translated

User defined text fields do not support multiple language translations such as:

- Some HART parameters (tag, long tag)
- File names.
- Shortcut labels.

Calibrating the touchscreen– System Menu

Begin calibrating the touchscreen

Select the **Calibration** icon to display a standard calibration screen. By tapping the crosshair when it appears in different locations on the screen, the touchscreen calibration is measured.



Accept the new settings or keep the old settings

After tapping the crosshair when it appears, the communicator offers you two choices:

- Either press the **Enter/Select** key to accept the new settings or touch the screen.
- Or, press the **Esc** key to keep the old settings. The Esc key is the **Cancel** decision key.

New calibration settings have been measured.
Press the Enter key to accept the new settings.
Press the Esc key to keep the old settings.

System Information – System Menu

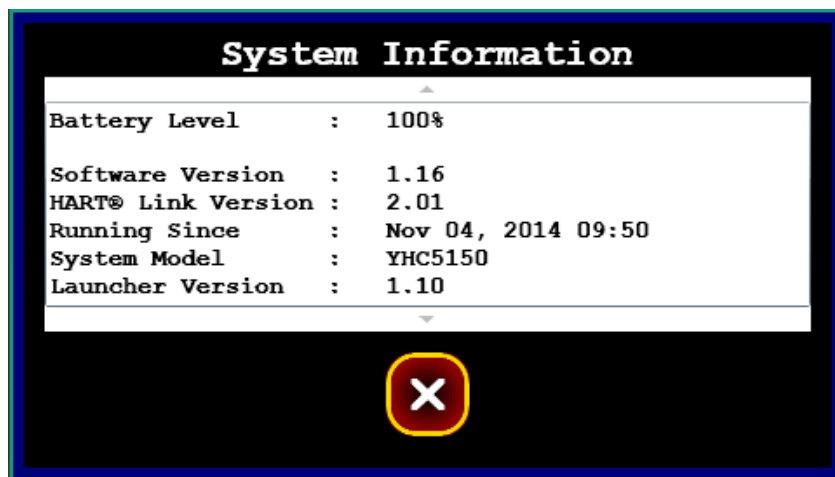
View status details about the communicator

The System Information icon displays information, such as Battery Level, Software Version, and other system details about the communicator.



System Information

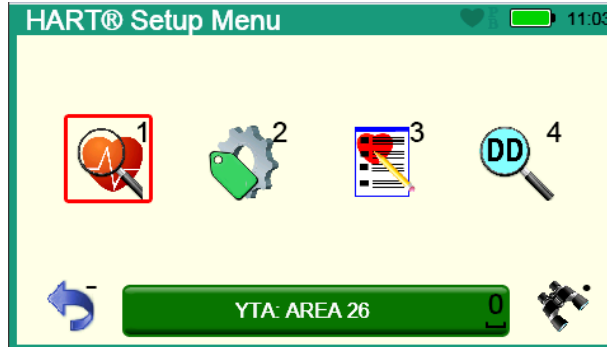
This display window lists both communicator information and HART information. Swipe up or down on the display to view more information. You can also use the up or down arrow keys to view more details.



HART Setup Menu





HART Setup Menu

The HART Setup Menu provides four options.



HART Setup icons

The following table lists the HART Setup Menu icons and describes them:

HART Menu Icons	Icon Name	Description
	HART Polling Address Range Selection	You can select a range of addresses to poll or select a tag or long tag to use in polling for a HART enabled device.
	Setup HART Tag For Display	You can select which tag to display on HART connection bar. Choices are tag or long tag. If a long tag does not exist on the connected device, a short tag will always be displayed.
	Offline Configuration	You can configure an offline device. See Advanced Tools
	DD Browser	You can review all DDs on the YHC5150X by manufacturer, device revision level, and DD revision level.

Shifting the highlight in HART menus

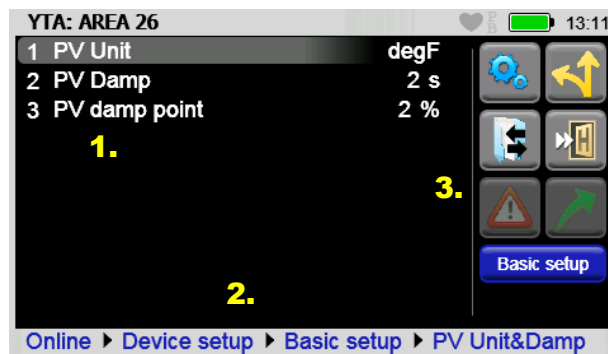
Connected HART devices

Once a HART device has been properly connected and HART communication is established between that device and the communicator, you can open HART Menus.

Three navigation panes

You can navigate the HART menus in three panes:

1. The Navigation pane.
2. The Menu Path bar pane.
3. The Function pane.



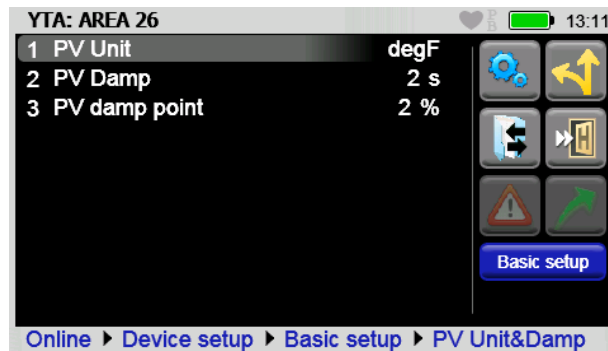
Shifting the highlight

Press the **Advance/Switch** key to shift between the three panes.



The Navigation pane has a gray highlight

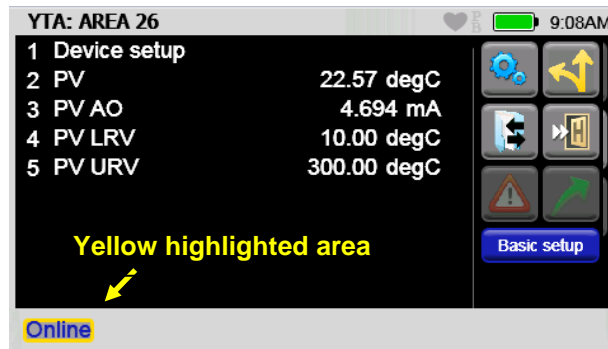
The highlighted menu line item in the **Navigation** pane appears as *gray*.



Shifting the highlight in HART menus (continued)

Yellow highlight on the menu path bar

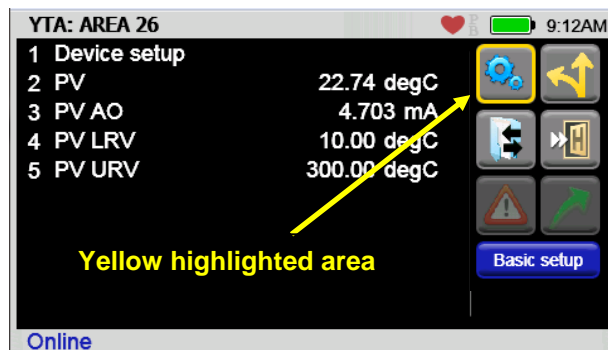
Press the **Advance/Switch** key once and the highlight moves from the Navigation menu to the **Menu** path bar. The highlight always defaults to the first menu in the path. This allows you to return to the home menu with only two key strokes (**Advance** and then **Enter**).



Note: The word **Online** in the screen shot above means you are at the root level menu in the HART menu system.

Yellow highlight on a Function button

Press the **Advance/Switch** key once and the highlight moves from the **Menu** path bar to the **Function** buttons on the right.

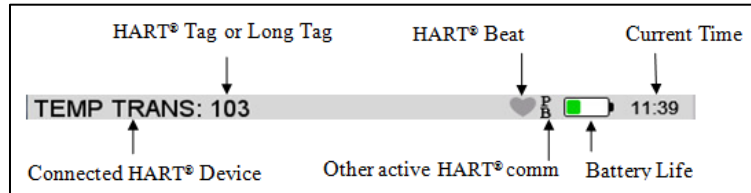


Note: Pressing the **Advance/Switch** key once moves the highlight from the **Function** buttons to the **Navigation** menu.

Status Line for the connecting device

Status line diagram

The **Status Line** at the top of the display contains HART communication and system information. See the features of the Status Line identified in the following figure.



Note: You cannot use the **Status** line to navigate.

Status Line descriptions

The following table lists the features of the Status line.

Status Line Part	Function
Connected HART Device	This displays the model name of the HART device currently communicating with the YHC5150X Series communicator
HART Tag	This displays the tag information returned from the HART device.
HART Beat	<ul style="list-style-type: none">• This alternates red and gray when there is active communication.• This remains gray when there is no communication.
Other active HART comm	This displays other HART devices that are active in the HART loop. <ul style="list-style-type: none">• “P” indicates a Primary Master.• “B” indicates a Bursting Slave Device in burst mode.
Battery Level	This displays the remaining charge (green) that battery pack has.
Current Time	Time of day.

DD files control HART menus

Device Description (DD) files

The HART DD files control the information that appears in the navigation pane. The DD becomes activated when the HART device connects.

Note: The manufacturer of the HART device and the HART Communication Foundation determine what appears in the navigation pane.

Menu Line Items

Menu Line Items have three columns in the Navigation pane:

- Parameter name.
- Parameter value.
- Parameter status.

Parameter status column

Green arrows in the right column indicate that you have changed parameter values that have not been committed to the device. This particular status only applies to parameters.

1	Snsr typ	T/C typ T	← Parameter has been changed by the user.
2	Snsr conectn	2 Wire	
3	Snsr1 snsr s/n	3942	←
4	50/60 Hz filter	60_Hz	
5	Alarm Latching	Alarm Latching Disabled	
6	Low Alarm Level	3.60 mA(NAMUR)	
7	Output Respons	Fast Output Response	
8	Final asmbly num	77294	
9	Tag	103	
0	-MORE-		

Note: Loading... in the parameter value column indicates the communicator is in the process of retrieving data for the first time.

The -MORE- menu item

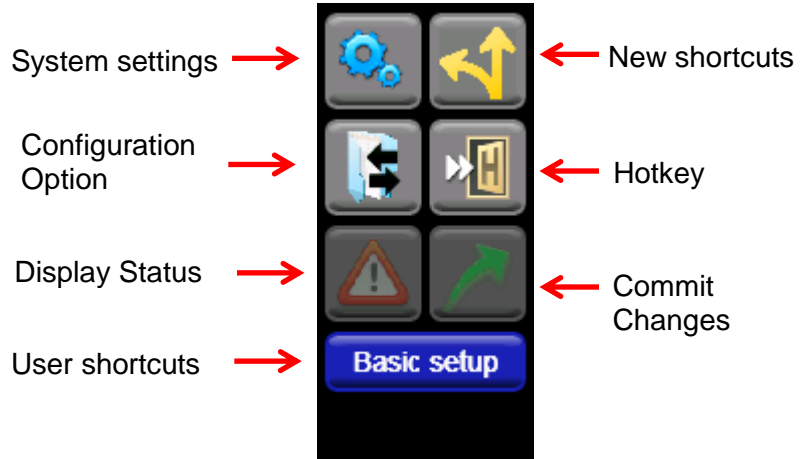
If there are more than 10 items on a menu, the tenth item displays as “-MORE-”.

Note: This has the advantage that you can continue to navigate using numeric keys instead of having to scroll.

Function buttons in HART menus

Navigating the Function buttons

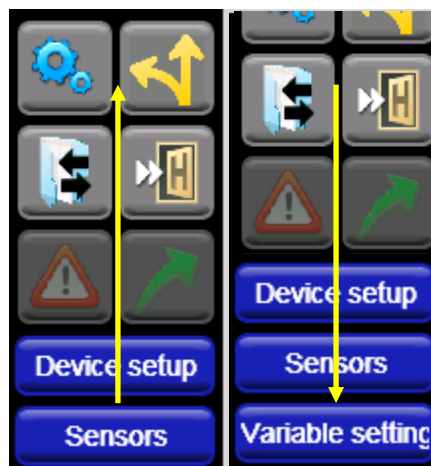
The following figure identifies the Function buttons and user shortcuts (examples of shortcuts).



Scroll up or down in the Function pane

When you create shortcuts, you may need to scroll up in the Function pane to see all the other shortcuts and scroll down to see the Function buttons.





Note: You can use your finger to swipe the touchscreen to scroll up or down or you can use the arrow keys to scroll up and down.. Compare the two following figures.



Function buttons: Explaining the buttons





Explaining the Function buttons

The following table lists the buttons with their functions in the HART menus.

Buttons	Function
	<p>The System Settings button returns you to the system menus.</p> <ul style="list-style-type: none"> • The HART connection is not dropped when you select this button. • Select the green HART connection bar to return to the HART menus when you have finished using the system menus. <p>Note: Some system setting changes may require the HART connection to be re-established before the changes will occur.</p>
	<p>The New Shortcuts button allows users to create shortcuts to HART menus.</p>
 	<p>The Select Configuration Option button displays two icons:</p> <ul style="list-style-type: none"> • The first is the Not ready button. It looks like a folder. It displays four options: <ul style="list-style-type: none"> ○ Retrieve Configuration (not active). ○ Store Configuration (not active). ○ Review Configuration (active). ○ Delete Configuration (active). • The second is the Ready button. It looks like folder that has two arrows. It displays four options: <ul style="list-style-type: none"> ○ Retrieve Configuration (active). ○ Store Configuration (active). ○ Review Configuration (active). ○ Delete Configuration (active).

Function buttons: More buttons

More Function buttons

Buttons	Function
	The Hotkey button – the company that manufactured the transmitter defined a menu that allows the user quick access to pre-defined functionality from anywhere in the HART menus.
	The Display Status button displays the current: <ul style="list-style-type: none">• HART device status.• Communication status.• More status available indicators. <p>Note: This button is only illuminated when there is a status available.</p>
	The Commit Changes button illuminates when you have modified parameters on the communicator and you have not committed those changes to the device. <ul style="list-style-type: none">• Select this icon to begin the process of updating the device to match the communicator parameters.• View a list of parameters that have been changed by highlighting the Commit button and select Accept.
	The User Shortcut buttons are device specific and appear when you have created shortcuts to simplify HART navigation on that device.

Creating Shortcuts

New shortcut button

Select the **New shortcuts** button if you want to create your own shortcut to the current HART Navigation menu. You can customize the name on a button using a maximum of 20 characters.

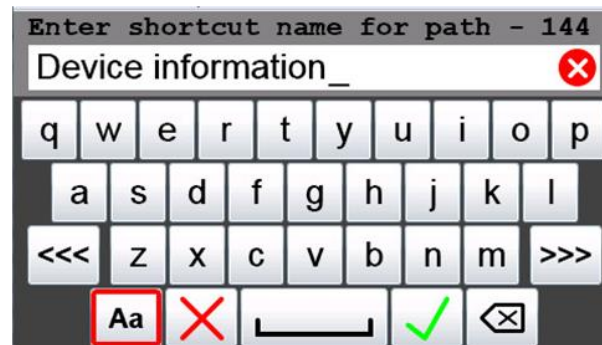
Note: In the following example, the new shortcut button appears under the Function buttons as *Device setup*. It was created to go back to Device Setup.



Managing shortcuts

Each device DD can have ten shortcuts. Only the shortcuts for the currently connected device appear while connected to that device.

- To delete all shortcuts for the current device, highlight the **New shortcut** button, and select **Cancel**.
- To delete a single shortcut, highlight the specific **User Shortcut** button and select **Cancel**.
- To rename a shortcut, highlight the specific **User Shortcut** button and select **Accept**.



Creating Shortcuts: Invalid shortcuts

NOTICE

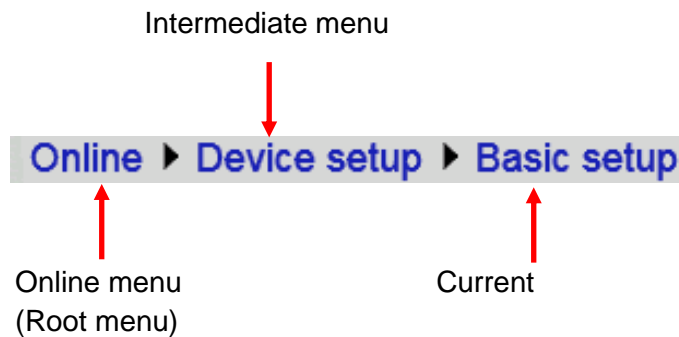
An invalid shortcut

It is invalid to create a shortcut on the **Online** menu (often called the **Root** menu).

HART menu path bar

Structure of the menu path bar

The HART Menu Path bar displays the current menu name and all the menu names along the menu path traversed to reach the current menu.



Note: The HART Menu Path bar also provides direct access to any of the menus along the menu path bar. Simply select the desired menu (touchscreen or arrow keys) from any displayed on the Path Bar and it will become the active menu.

Advanced Tools for HART: Two Option buttons

Two Functions

The YHC5150X provides you with two advanced options:

1. **DD Browser:** Use this button to review all the DDs on the YHC5150X.
2. **Offline Configuration:** Use this button to:
 1. Create new configurations.
 2. Modify existing configurations.

Note: To use both functions you can navigate the three levels.

1. Manufacturer (first level).
2. Device name (second level).
3. Device revision number (third level).

Three ways to navigate in the DD Browser

Select the **DD Browser** button to navigate the levels.

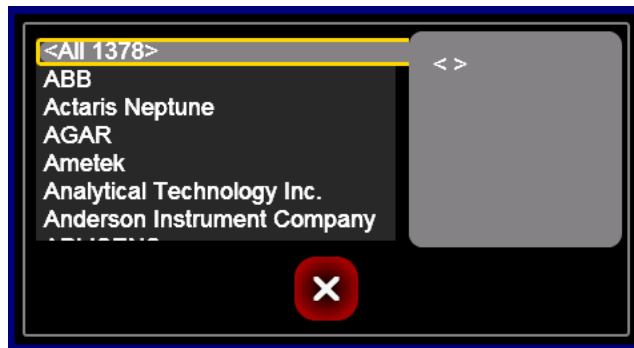


Three ways to navigate through the lists in each level:

1. Select the **up** or **down** arrow keys.
2. Type one or more letters of the manufacturer's name or device name.
3. Tap the touchscreen to select a name or device.

Cancel button in DD Browser

Select the **Cancel** button (the red button with the "X") to return to the **HART Setup Menu** from any of the levels in DD Browser.



Note: <ALL 1378> tells you that there are 1378 DD files in total.

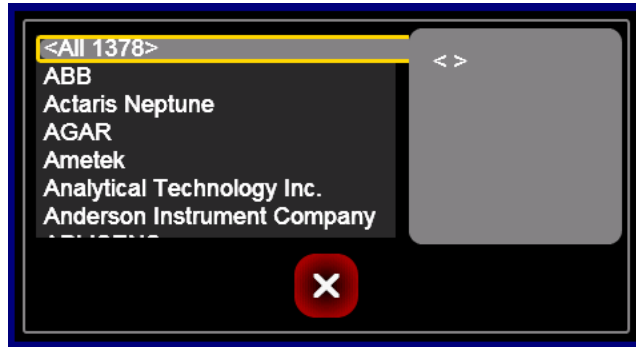
Advanced Tools for HART: DD Browser

Use the DD Browser to view a list of manufacturers

Typing one or more letters is the fastest way to navigate to the manufacturers' list. Use the up and down arrows to move to a specific manufacturer.

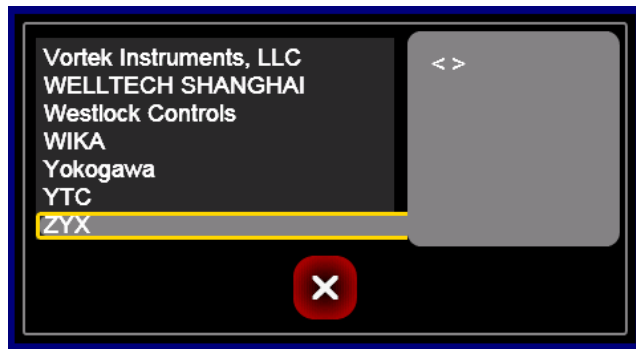
Do one of the following to view the devices by that manufacturer:

1. Select the **Enter** key.
2. Tap the touchscreen to select a specific one.
3. Select the **right** arrow key.



Navigate lists in a complete circle

1. Select the **up arrow** key when you are on <ALL 1378> to navigate to the end of the alphabet. (See the figure below.)
2. Or, select the **down arrow** key when you are at the end of the alphabet to go to the beginning of the alphabet. This feature allows you to navigate in a circle.

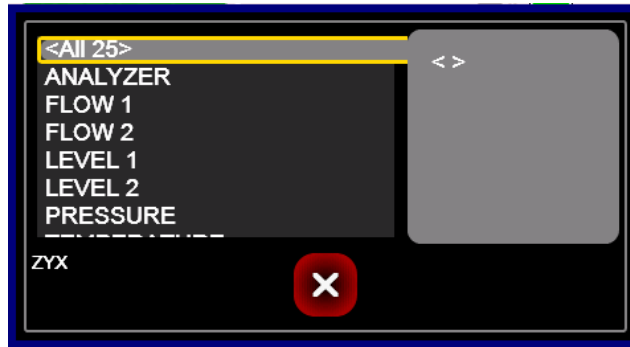


Note: Navigating in this way applies to all levels in the DD Browser and Offline Configuration.

Advanced Tools for HART: View device names and revisions

View a list of device names

1. When the list of device names appears, you may use the up and down arrow keys or select one or more letters to jump quickly through this list.
2. Select the **Enter** key or the **right arrow** key to view all the device revisions for that device.



Note: <ALL 25> tells you that the ZYX manufacturer has 25 DD files.

View a list of device revisions

1. When the list of device revisions appears: you may use the up and down arrow keys to jump quickly through this list.
2. Select the **right arrow** key to highlight the DD revision for that device revision.

Note: The bottom left side of the screen displays the manufacturer's name and the device name. The bottom right side displays the file name.



Remember: You can use the **left arrow** key to move back through the other levels to:

1. Device revisions.
2. Device names.
3. Manufacturers.

The right side of the screen (gray area)

On the **Device Revision** level, the right side displays details about what you selected on the left side. (See the figure above.)

Advanced Tools for HART: Offline Configuration

Offline Configuration navigation

Select this button to navigate the offline configurations. You navigate them the same way you navigated through the levels in the DD Browser.



Note: If you are communicating with a physical device when you select this button, the message *Disconnect and try again* appears.

Two ways to use the offline configuration

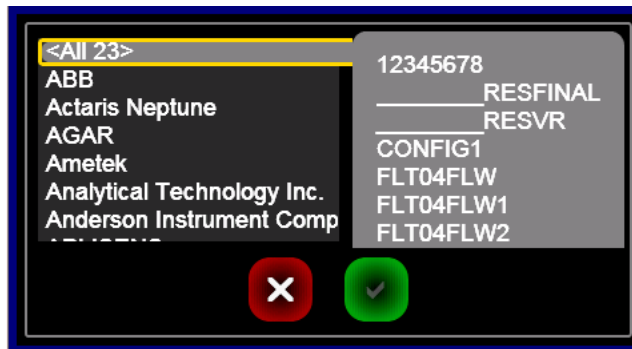
After selecting the Offline Configuration button, you can:

1. Create a new configuration from:
 - a. A <BLANK> configuration.
 - b. An existing configuration on the YHC5150X and store it with a new name.
2. Edit an existing configuration.

The <All> configurations on the first screen

The <All> selection:

1. **New 5150s** do not have saved configurations so none are listed in the <All> gray area on the right side.
2. **5150s with saved configurations:**
 - a. In the figure below, that YHC5150X has 23 device configurations stored on it.
 - b. Select the right arrow or tap the right side to make it active.
 - c. You can navigate this list in the same way as in the DD Browser.
 - d. You may select an item on the right side instead of having to navigate through the manufacturers, device names, device revisions, and <BLANK> DD files.



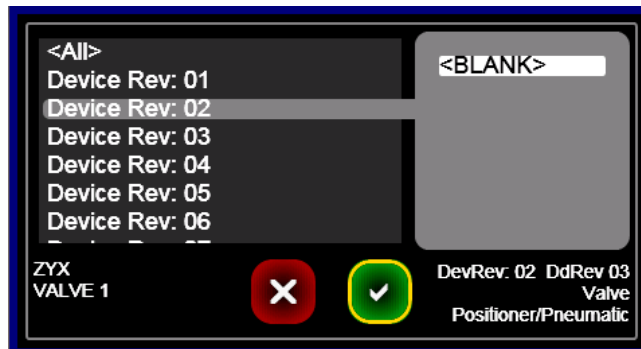
Note: As you navigate to specific manufacturers, you will see the appropriate configurations for your selection. As you navigate through specific devices and revisions, you will see fewer and fewer.

Advanced Tools for HART: Offline Configuration

Creating a new configuration

Create new configurations in one of two ways:

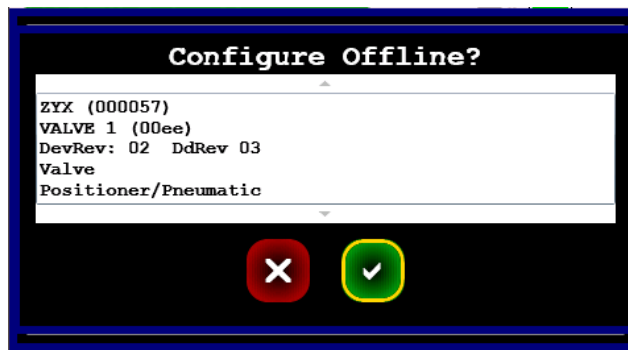
1. Select a DD configuration from the list on the right side and **Store** it with a new name.
2. Navigate the lists of manufacturers, device names, device revisions, and select
 - a. Select <BLANK> to create a new DD configuration offline.
 - b. Select the green checkmark.



Note: <BLANK> only appears at the last level.

Confirm you want to create an offline configuration

Select the green checkmark to confirm that you want to create an Configure Offline.

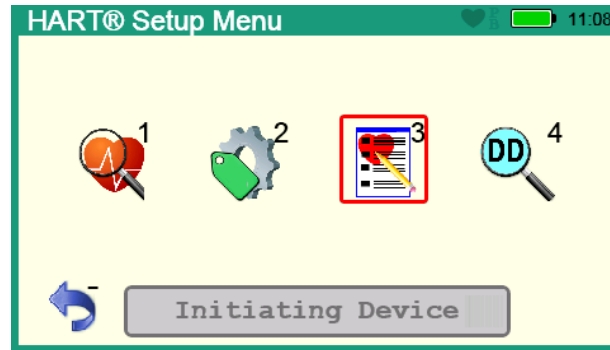


Note: Selecting the **Cancel** button takes you back to the HART Setup Menu.

Advanced Tools for HART: Waiting for the Offline Configuration

Wait - while the YHC5150X initiates the offline device


After confirming your selection, the YHC5150X returns you to the HART Setup Menu briefly while it initiates the offline device configuration.



Blue connection bar

When the connection bar turns **blue** with the name of the offline device you selected, you can select the bar to create an offline configuration.



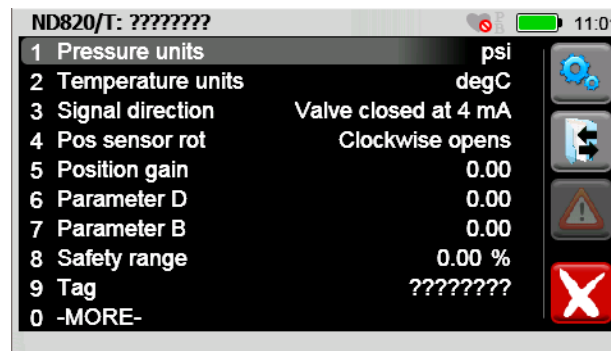
Note: The offline icon  covers part of the HART icon to indicate that you are no longer connected to a physical device.

Advanced Tools for HART: Indicators in Offline Configuration

Question marks and default variables in the DD file

When a <BLANK> offline configuration appears, you may see:

1. **Question marks:** These appear in text fields and they mean that the DD file had been created offline and the YHC5150X doesn't know what the values should be.
2. **List values:** The first value listed in the DD file displays as the default value.
3. **Zeros:** These may be the actual default value or they represent other possible values.



Note: The question marks on the title bar come from the **Tag** field.

Modified parameters alert – yellow arrow

When you change a parameter in an offline configuration, a yellow arrow appears in the **Status** column alerting you to unsaved changes.

1. Select the **Configuration Options** button in the **Functions** panel to **Store** the configuration with a name.
2. This stored configuration will appear in the first level <All> list and appropriate subsets. Additionally, the number next to <All> increases by one.



Advanced Tools for HART: Function buttons

Function buttons in Offline Configuration

During Offline Configuration, there are only four **Function** buttons available.



The **System Settings** button takes you to the HART Setup Menu. Press the Blue connection bar to return.



The **Configuration Options** button provides you with the same options as online configurations.



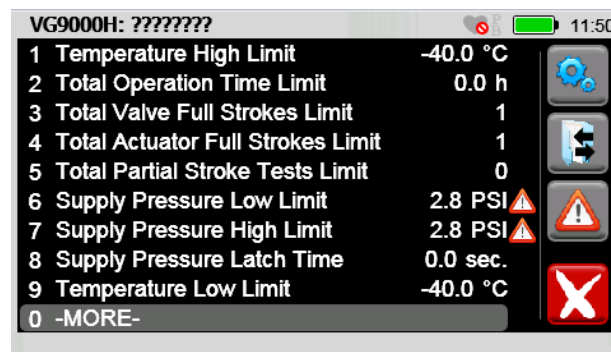
The **Display Status** button alerts you to parameters with undetermined values. See the figure below.



The **Cancel** button stops the Offline Configuration and returns to the HART Setup Menu with no offline configuration device displayed.

Note: Only when you create a configuration offline - like the one in the figure below - does an undetermined value appear. An undetermined value is a common offline state when there are conditions on which the parameter is dependent (conditional attributes).

Recommendation: You should change these parameters before storing this configuration.



NOTICE

When you download a DD or configuration from **FC Manager**, you must turn off the YHC5150X and turn it on to see these new files on the YHC5150X.

HART Communication with the YHC5150X Series

Maintain field devices

The communicator provides device specific HART communication functions that allow the user

- To poll.
- To commission devices.
- To configure or re-configure.
- To maintain supported HART field devices.
- To maintain devices through analog and sensor trim adjustments.

HART commands

To facilitate communication with a HART field device the communicator uses the following commands:

- Universal,
- Common Practice and
- Device Specific.

Device Description file (DD) uses

- Many other features defined by the device manufacturer are also supported.
- The communicator will communicate with any HART device through Universal and Common Practice Commands using the standard Generic DD but must have the DD for a specific HART device installed before it can execute Device Specific Commands.
- When HART device support for new devices becomes available, the communicator software can be easily updated using a computer with an internet connection and software provided.

Updating your communicator with DDs

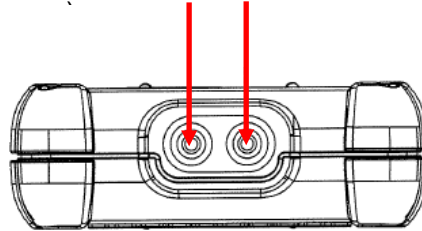
See the section for [Updating communicator software](#) for more information and links about DD files.

Connecting the YHC5150X to Smart Transmitters with HART technology

Banana Jacks

You make HART connections using two standard banana jacks (3/4 in. center) located on the top of the communicator.

HART connections are standard banana jacks (3/4 in. center or 1.9



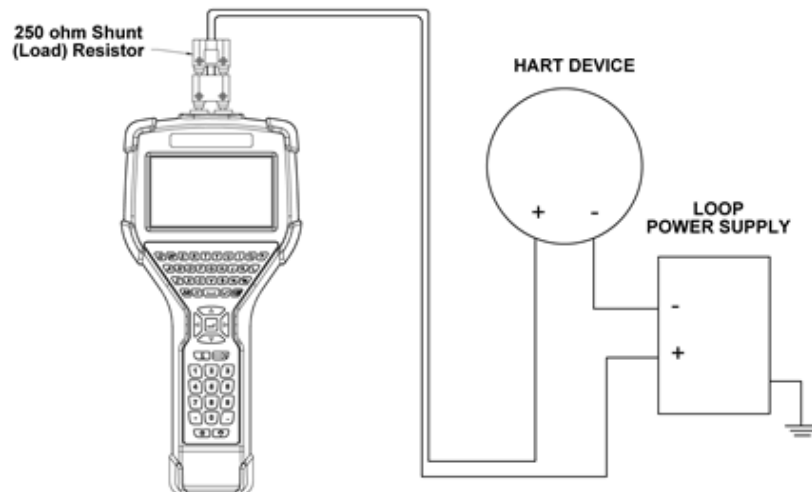
Note: Polarity is not a concern for HART connections. Therefore, both jack collars are black.

Note: Yokogawa supplies a HART lead kit complete with mini-grabber connections and a 250 Ω load resistor with each unit.

Part number 1W-A900529-00014

Wiring diagram: Loop resistance < 250 Ω

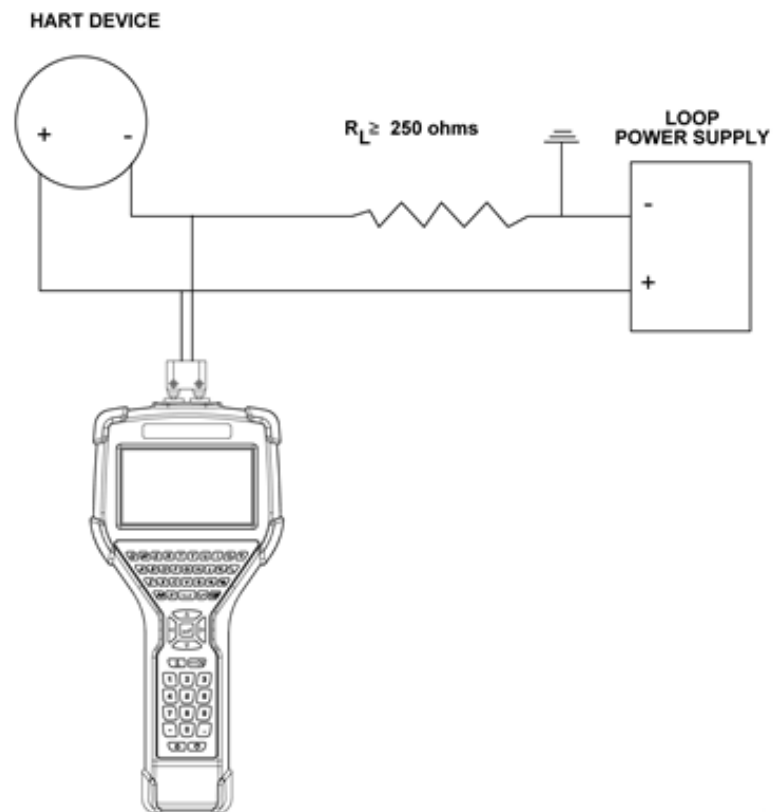
For low loop resistance (less than 250 Ω), a 250 Ω resistor may be needed in the loop to insure reliable HART communication. Yokogawa supplies a 250 Ω load resistor in the form of a standard adapter (part number ZA36821). Refer to the following diagram for connection details.



Loop resistance > 250 Ω

Wiring diagram: loop resistance > 250 Ω

When connecting the communicator to a loop with a resistive load greater than 250 Ωs, the HART jacks may be connected across the loop + and - or to the HART device communication terminals. Refer to the following diagram for connecting across the loop + and -.



Polling: HART Communication

A communicator is in one of three states:

The three states are:

1. Polling.
2. Initiating.
3. Connected.

Note: If the communicator is not connected or initiating, then it is always polling for devices on a loop.

Gray connection bar: Polling Address or Found is “0”

When the bar is gray, there is no device found.



Gray connection bar: Initiating

When the bar is gray, the currently selected device is in the process of connecting.



Gray connection bar: no actions

If you select the gray bar, no action will occur. The communicator will continue to send poll address messages within the configured range as long as a device has not been selected for connection. If new devices are added to the loop, within the configured range, they will be found automatically.

Yellow connection bar: Number of Devices Found

A yellow bar displays the number of devices that the communicator has found.



Polling: HART Communication (continued)

Display all devices

Select the yellow connection bar to display a list of connected devices.



Select a device

Select a device and select **Accept**.

- The box collapses and the communicator initiates a connection.
- Once the device connects the bar turns green.

Green connection bar: connected

Whenever the bar is green, it indicates that a device is actively connected to the communicator.

- The communicator does not continue to poll for other devices.
- If the green bar is selected, the communicator initiates the online HART menus.
- If you want to connect to a different device, select the Restart Poll icon to resume polling for devices and the current HART connection will be dropped.

Specific and Generic HART communication

Find specific devices

The communicator supports a large and growing number of Device Specific DDs (Device Definition files).

Find generic devices

The communicator includes Generic HART Communication capability to communicate with HART devices that are not yet supported with Device Specific DD files or that do not require DD files.

- Generic communication allows you to communicate with any HART device using Universal and Common Practice commands to poll, configure, and maintain HART devices.
- Specific functions supported include most polling, tagging, device configuration and trim operations for analog outputs.
- Generic communications do not support Device Specific commands for higher order HART functions.
- Review the User's Manual for the HART device of interest for more information on device specific command support.

Generic starts automatically

The Generic HART Communication mode starts automatically when HART communication is initiated with a device for which no Device Specific DD (device object file) is stored in the communicator's flash memory. When this occurs, the status line displays:

- *Generic.*
- The device tag.

Generic mode running

In general, the Generic HART mode operates similar to its device specific DD counterpart:

- See section [Polling: HART Communication](#) of this manual for more details.
- However, the communicator does not display Device Specific related communication menus or options when in the Generic communication mode.
- For example, the **Zero** and **Sensor trim** menu options (normally executed by Device Specific commands) are not displayed for pressure transmitters without DD support.

Managing Configuration Files

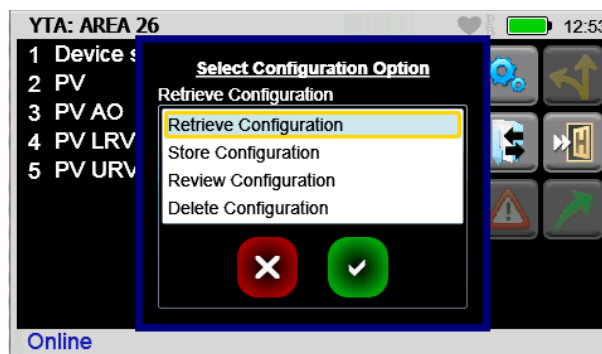
The Configuration Option button

The **Configuration Option** button gives you four configuration options.



Four configuration options

After you select the **Configuration Option**, it displays four options:



Managing Configuration Files (continued)

First Option: Retrieve a device configuration

To retrieve a device configuration, you select the **Configuration** button.

- The configuration files are stored per device model and revision.
- When you select **Retrieve configuration**, only the configurations that pertain to the model of the connected device are displayed.
- You can select a file and select **Accept**. This retrieves the stored parameters to the communicator's parameter cache.
- The parameter-changed indicator appears next to the affected parameters, and the Commit Changes button is illuminated.
- You now have the option of making further modifications to the parameters on the HART menu or committing them to the device.

Note: You cannot retrieve a configuration until all configuration parameters from the device load.

Second Option: Store files to μ SD Memory Card

You may store the current parameter settings for a connected HART device as a file on the μ SD system card for later use. This file can then be used:

- For duplicating settings to a new device of the same model.
- For restoring settings to a repaired device.
- For documentation purposes.

Note: You cannot retrieve a configuration until all configuration parameters from the device load.

Note: The manufacturer of the HART device defines what parameters are stored.

Managing Configuration Files (continued)

Configuration dialog boxes

Dialog boxes direct you to take the appropriate actions:

1. They prompt you for a file name. The default file name is the tag parameter defined in the device. You may change this to any file name not currently in use for this device model. If the user picks a name already in use, the communicator gives you an option of cancelling or overwriting the current file.

Note: Unsupported characters are unavailable and ignored.

2. If the configuration has not already been marked as **As Modified**, the user has to choose a configuration type. The choices are:

- a. **As Found** (device settings before modification).
- b. **As Left** (device settings after modification).

Note: The configuration file is saved in the communicator μ SD memory card and can be retrieved to update any transmitter of the same model and revision.

Third option: Review Configuration

This option allows you to select a configuration to review all the parameters in it.

Fourth option: Delete Configuration

This option allows you to delete a configuration that you no longer want to keep.

Note: You do not need to delete configurations to save space on the memory card.

Managing Configuration Files (continued)

Commit Changes

If the **Commit Changes** button is illuminated, you should commit the communicator parameters to the device before you continue.

- If the parameters are not committed and you choose to store the parameters, you are warned that the parameters do not match the device.
- If you decide to continue to store the file, it is marked as **As Modified**.



NOTICE

Be careful when retrieving a configuration

Before retrieving a configuration, remember that **Retrieving a Configuration** overwrites any uncommitted configuration parameters that have not been committed to the device.

Important: Consider whether you need to **Commit Changes** to the device *now* to avoid losing any modified, uncommitted parameters.

Troubleshooting HART Communications

Troubleshoot: No Devices Found

If a HART device is connected to the communicator but “*Polling Address 0*” appears or the device is not in the table of found devices, follow these steps:

1. Make sure all connections are correct and secure.
2. Check for shorts, open circuits, and multiple grounds.
3. Determine if the loop resistance is greater than 250 Ω and less than 1100 Ω s. If less than 250 Ω , then use the supplied 250 Ω load resistor in series with the loop (see the diagram in the [Connecting the YHC5150X to Smart Transmitters](#) section).
4. Determine if any device is in burst mode. Disable burst mode if possible during troubleshooting.
5. Check the polling address type and range selected from the system menus. If the polling address set on the transmitter is outside of the range selected for the communicator, it cannot discover the device.
 - a. Set the poll type to “by address” and set the polling address range to the maximum:
 1. 0-15 for HART Universal Revision 5 devices.
 2. 0-63 for newer HART devices.
 - b. Allow the communicator to poll and determine if the device is found.
6. If multiple HART devices are in the loop, there could be an address conflict (two devices at same address). Testing the devices individually is the best path.
7. Determine if there are multiple master devices on the loop. HART communication only permits one primary and one secondary master.
8. Remove all other secondary master devices from the loop for troubleshooting.

Troubleshooting HART Communications (continued)

Troubleshoot: Generic

When the message *Generic* displays after connecting to a HART device, there are two possible causes:

1. No device-specific DD for that device is currently installed in communicator memory. This could occur if the device DD has not been released by the HART Communication Foundation, or if the DD database on your computer requires updates. See the following resources:
 - a. See the section [Updating communicator software](#).
 - b. See <http://www.hartcomm.org/> for full list of DDs.
2. The connected HART device supports only HART Universal and Common Practice commands (for example: generic commands). There are several such devices on the market, particularly level type devices.

Troubleshoot: Multiple Devices

If multiple devices of the same name appear at different addresses, the cause is normally a HART Universal Revision 5 device in the loop and the polling range selected on the communicator extending beyond HART polling address 15. This generally causes no problems and you may select any one of the duplicate entries to connect to the device.

Note: Addresses beyond 15 were undefined until HART Universal Revision 6.

Updating communicator software

Follow these instructions

The following link contains the instructions and links necessary to update your communicator software:

- System files.
- DD files.

http://www.5150update.com/Installing_Field_Communicator_Manager_Software.pdf

Important note about updating the communicator

Depending on the amount of data to transfer from the computer to the communicator, this step can take a long time.

Hazardous area use

Intrinsically Safe Model

The YHC5150X HART Communicator includes certification for Intrinsically Safe operation.

- Refer to the [Intrinsic Safety Control Drawing](#) in the *Appendix* of this manual for more information.

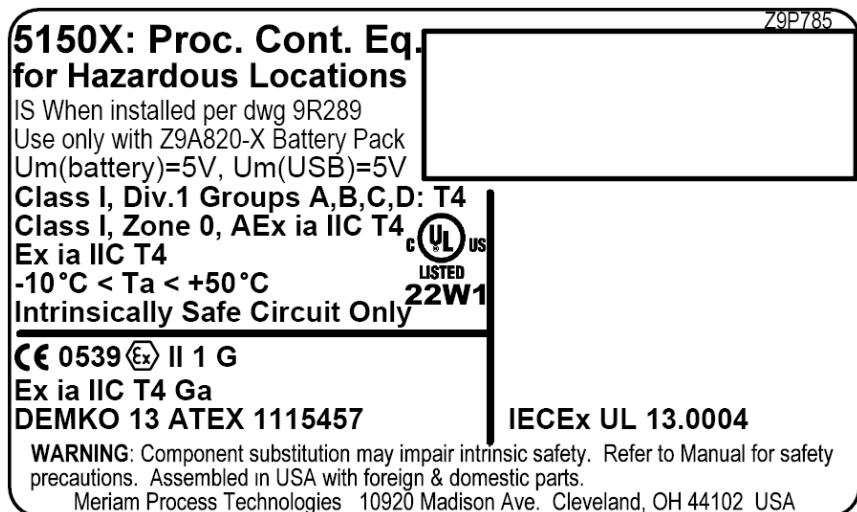
Hazardous and non-hazardous locations

The following table identifies model numbers and areas of acceptable use:

Model Number	Location	Non-hazardous Area	Hazardous Area
YHC5150X	Intrinsically Safe	Yes	Yes

Example of a name plate

Communicators with Intrinsically Safe certification can be identified by model number or by a special name plate on the back. One example of a nameplate on an Intrinsically Safe communicator is displayed in the following figure for reference.



Hazardous area - Warnings & Cautions

⚠ WARNING

No substitutions

IMPORTANT: Substituting components may impair Intrinsic Safety.

⚠ WARNING

Preventing explosions

IMPORTANT: To prevent ignition of flammable or explosive atmospheres:

- Disconnect power before servicing.
- **NEVER** attempt to open the battery pack and replace batteries.

⚠ CAUTION

Restrictions on electrical connections

Serious injury or death may result from explosions.

Before making electrical connections to an Intrinsically Safe model at the HART jacks, verify the HART instrument of interest is installed in accordance with intrinsically safe field-wiring practices.

⚠ CAUTION

Restrictions in hazardous areas

Restrictions apply to the use of Intrinsically Safe units in hazardous areas.

- Refer to [Intrinsic Safety Control Drawing](#) in the *Appendix* of this manual for more information.
- Yokogawa reserves the right to revise the Intrinsic Safety Control Drawing without notice.
- Contact Yokogawa for the current Intrinsic Safety Control Drawing. (phone 800.888.6400)

⚠ CAUTION

Double check the Intrinsic Safety Control Drawing

For Intrinsically Safe model YHC5150X, consult the [Intrinsic Safety Control Drawing](#) in the *Appendix* of this manual for:

- Restrictions.
- Special instructions in use.
- Electrical connections allowed.

Returning for repair

First - Request a Number

In the event that a YHC5150X Series requires service and must be returned for repair, please contact Yokogawa at the numbers listed below.

To assist us in processing your repair request, please have the Model & Serial Number of the unit available when you call. This information is located on the YHC5150X Series label.

Method	Information
Phone:	1-800-888-6400
Web:	www.yokogawa.com/us
E-mail:	We need the following information in the email: <ul style="list-style-type: none">• Look on the YHC5150X Series label to find the Model number & the Serial number.• Give a brief description of the problem.• Send the e-mail to: meters-instr@us.yokogawa.com

Return Material Authorization

Do not send any unit for repair unless you contacted Yokogawa for a Return Material Authorization (RMA) number.

- **Important:** If you have not received this number and clearly marked it on the package being shipped back, we will return the unit at your expense.
- The **Yokogawa Repair Department** will provide you with this number when you call or e-mail your information.
- An RMA number must accompany all incoming packages to insure proper tracking, processing, and repair work

Ship the box to

Yokogawa Corporation of America
2 Dart Road
Newnan, GA. 30265

Appendices

Product Specifications

BASE UNIT:

11.9 in. L, 5.6 in. W (at display), 2.50 in. W (at handle), 1.9 in. D.
(30.2 cm L, 14.2 cm W (at display), 6.3 cm W (at handle), 4.8 cm D)

PC/ABS alloy plastic case with shock absorbing bumpers, rated IP51, 2.1 lbs. including battery. Passes one meter drop test onto concrete

DISPLAY:

4.3-in. widescreen backlit TFT color touchscreen display with 480 x 272 WQVGA pixel resolution.

POWER:

Li-ion battery pack, 3.6 volts nominal.
1.5A charging cradle. 100-240Vac, 50/60Hz input.

BATTERY LIFE (Approximate):

10 hours continuous use (typical)
40 hours standby (typical)

TEMPERATURE SPECIFICATIONS:

Storage: -40° F to 140° F (-40° C to 60° C)
Operating: 14° F to 122° F (-10° C to 50° C)
Charging: 50° F to 104° F (10° C to 40° C)

CONNECTIONS:

Standard banana jacks (3/4 in. center) for HART communication.
Communication (serial cable to computer port) / Battery charging. Connection via charging cradle.

APPROVALS: 5150X (ATEX/LS.)

ATEX Intrinsically Safe
cUL_{us} Listed



G; Ex ia IIC T4 Ga

Intrinsically Safe, Exia

Class I, Div. 1 Groups A, B, C, D: T4

-10° C < Ta < +50° C


IECEX UL 13.0004

Entity parameters:

Pi = 1.25W, Ii = 200mA, Ci = 0, Li=0, Vi=30V, Um (USB) = 5V, Um (battery) = 5V

 CE compliance

APPROVALS: 5150 (general purpose)

 CE compliance

MEMORY:

Dedicated µSD flash memory card for 5150 Series application software, DD and configuration storage.

Safety notices

⚠ WARNING

Avoid intense heat

Do not subject the batteries to intense heat. This could cause:

- Overheating,
- Fire,
- Rupture, or
- Explosion.

⚠ CAUTION

Electrical shock

If there is any...	Then...
<ul style="list-style-type: none">• Deformation,• Cracks,• Damage to the charging cradle,• Damage to the power cord, or• Damage to the power adapter.	<ul style="list-style-type: none">• Unplug the charging cradle.• Never use it again.

⚠ CAUTION

Don't disassemble or modify

Do not take apart or modify any component. This could:

- Cause personal injury.
- Cause the communicator to fail.
- Invalidate certification.
- Void the warranty.

⚠ CAUTION

No extension cords

Plug the power adapter directly into an outlet.

Important: Do not use an extension cord with the power adapter.

Waste Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC

European Union *only*

Important: This directive is only valid in the EU.

- This product complies with the WEEE Directive (2002/96/EC) marking requirement.
- The following marking indicates that you must not discard this electrical / electronic product in domestic household waste.



European Union Product Category

With reference to the equipment types in the WEEE directive Annex 1, this product is classified as a “*Monitoring and Control Instrumentation*” product.

- Do not dispose of in domestic household waste.
- When disposing of products in the EU, contact your local Yokogawa Europe B.V. office.

US government agencies

You must check with the US Environmental Protection Agency (EPA), state agencies, and other local authorities before you dispose of electrical or electronic waste.

- The EPA www.epa.gov
- You must remember that some state and local authorities have stricter requirements than the federal requirements.

Other countries

You must check requirements of your national and local regulations before you dispose of electrical or electronic waste.

Spare parts list

Spare Part numbers

See [Yokogawa Contact Information](#) to order these parts:

Part Number	Description
1W-A900529-00014	HART Test Lead Kit - included with unit. This is the standard banana plugs, mini-grabbers, 250 Ω shunt resistor.
1W-A36821	Standard size 250 Ω shunt resistor - included with unit. This is required for HART low resistance loops.
1W-9P790	Soft carrying case - included with unit. This is a custom, soft case with adjustable shoulder strap and HART lead compartment.
1W-9P791	Hand strap - included with unit.
1W-9A820-1	YHC5150X Series Lithium Ion Battery Pack - included with unit.
1W-9A879	YHC5150X Series battery charging kit - included with unit. 100 – 240 Vac, 50/60 Hz. It includes charging cradle, power cord, and USB cable.
1W-9P802	USB cable: Type A to B. It is 2 m length (6.60 feet) - included with unit. You must have this to update the unit.
1W-9P822	YHC5150X Series battery charging power cord - included with unit.
1W-9P823	7/64 in. Hex key wrench - included with unit. This fits the battery pack screws.
1W-9P780	YHC5150X Series μSD system memory card - included with unit. The YHC5150X software is installed on it.
1W-9A1100	Kickstand Replacement Kit – included with unit.

Intrinsic Safety Control Drawing

NON-HAZARDOUS LOCATION

YHC 5150
YHC 5150X

Charger assembly may be used. (Melexem P/N 236473)

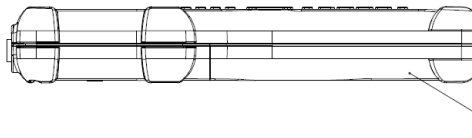
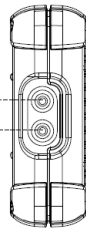
AGCC adapter may be used. (Melexem P/N ZSF822) Input: 110-240 VAC / 50/60 Hz, 24 Watts, 1.5 Amps, 15 Vdc

Um (battery) = 5V, Um (USB) = 5V

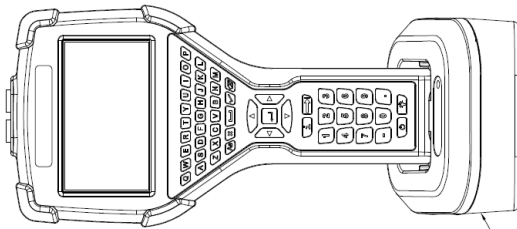
ALL SAFETY INFORMATION CONTAINED ON THIS DRAWING IS IDENTICAL TO 95298.

Hart Terminals:
30 VDC == Max.

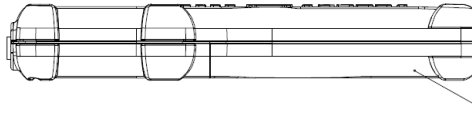
Hart Communication



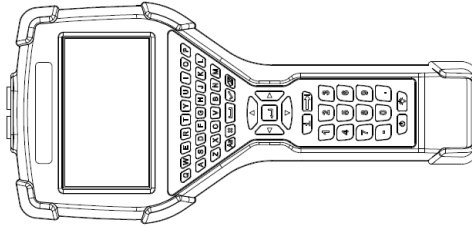
5150 Series Battery Pack



5150 Series Charger/Asm



5150 Series Battery Pack



HAZARDOUS LOCATION

YHC 5150X

Melexem P/N 236473
Melexem P/N ZSF822
Melexem P/N 236473
Melexem P/N 236473
Melexem P/N 236473
Melexem P/N 236473

Hart Terminals:

Connect to Certified Intrinsically Safe circuit only (for Hart Communication).
UI = 30V, Ii = 200mA

PI = 1.25W, CI=0, LI=0

Note: Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in table 1. Cable capacitance, Cable, plus intrinsic safe equipment capacitance, Ci, must be less than the marked capacitance, Ca (or Co) shown on any associated apparatus used. The same applies for inductance (Lable, Li and La or Lo respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used. Cable = 60pH/ft., Cable = 0.2 uH/ft.

TABLE 1:

INSTRUMENT	ASSOCIATED APPARATUS
Li	Li (or Li)
La	La (or La)
Lo	Lo (or Lo)
Ca	Ca (or Ca)
Co	Co (or Co)
CI	CI (or CI)
LI	LI (or LI)

If Po of the associated apparatus is not known, it may be calculated using the formula: $P_o = (V_{oc} \cdot I_{sc}) / 4 = (U_o \cdot I_{o1}) / 4$

REV.	ENL	REVISED BY	DATE	ENGINEER	DATE	APPROVED	DATE
1		WAKSMAN JR.	5/10/13	WAKSMAN JR.	4/29/13	J. NEWMAN	4/10/13
2		WAKSMAN JR.	5/20/13	WAKSMAN JR.	5/10/13	J. NEWMAN	5/10/13
3		WAKSMAN JR.	5/20/13	WAKSMAN JR.	5/20/13	J. NEWMAN	5/20/13

WARNINGS:

1. SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

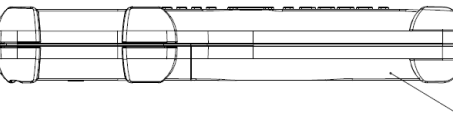
To prevent ignition of flammable or explosive atmospheres.

- Do not use any battery pack other than 5150 Series Pack Z3625X.
- Do Not Charge In Hazardous Location.
- Do not use any battery pack other than 5150 Series Pack Z3625X.
- Do Not Charge In Hazardous Location.

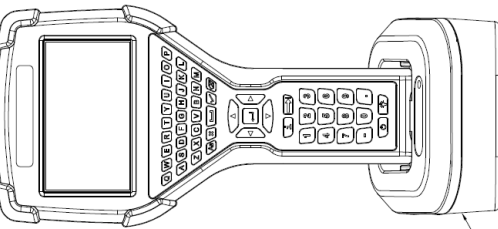
2. Associated apparatus shall be marked by a resistor such that the maximum capacitance at its output be known between open-circuit voltage and short-circuit current.

3. Selected associated apparatus must be third party listed as providing intrinsically safe circuits for the application, and have Voc or Vt not exceeding Vmax (or Lo not exceeding UI), Isc or It not exceeding Imax (or Lo not exceeding II), and the Po of the associated apparatus must be less than or equal to the Pmax or PI of the intrinsically safe equipment, as shown in Table 1.

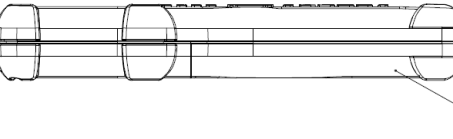
4. Associated apparatus must not be used in combination unless permitted by the associated apparatus certification.



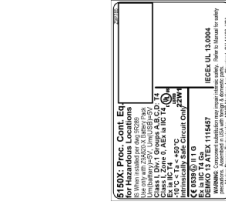
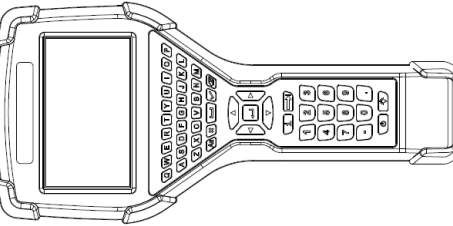
5150 Series Battery Pack



5150 Series Charger/Asm



5150 Series Battery Pack



CERT LABEL

NOTE: APPROVED METAL PARTS ARE CONSTRUCTED FROM 300 SERIES STAINLESS STEEL. METAL PARTS MADE FROM STEEL WITH ZINC PLATE, NO LIGHT METALS ALLOWED.



SMALL BATTERY LABEL

Approved for Field Use



LARGE BATTERY LABEL

ALL DIMENSIONS ARE IN INCH/[cm]	
YOKOGAWA	
2 HART ROAD	NEWMAN, GEORGIA 30053
TITLE YHC 5150 HART COMMUNICATOR	
REVISED BY FX1-M1202JX	REV. 2
DRAWING SIZE C	SCALE N/A
	SHEET 1